Pests

1938
December
VOL. 6 NO. 12

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

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Merry Christmas

AT this time of the year the advent of the Christmas season rekindles in our hearts the appreciation of our many friends.

We remind ourselves of pleasant associations and our many friendly business contracts. We wish we could grasp the hand of every reader and convey our good wishes by word of mouth. So, across the miles here is a hearty handclasp and a fervent wish that the best may be yours this Christmas season and that the New Year will bring you the utmost in health, happiness and prosperity.

PESTS

Pests

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

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CONTENTS

"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

Editorial 4-5

Relations of Entomologists and Pest Control Operators 6
By J. J. Davis

Over Fifty Pest Control Operators Attend Baltimore Meeting 7

The Early History (1848-1918) of the Use of Derris as an Insecticide 8
By Dr. R. C. Roark

Common Problems Arising in Relation to Household Fumigation 10
By J. L. Horsfall

Hazards in Relation to Household Fumigation 14
By I. L. Ressler

National Association of Insecticide and Disinfectant Manufacturers Hold 25th Annual Meeting December 5-6 17

Greetings from the President 18

Chlorpicrin 18
By Conrad C. Johnson

Local Organization News 20

What's New in Pest Control—Personals 21

Write for these Booklets 23

Additional Patents Relating to Pest Control 24
By Dr. R. C. Roark

Rat Campaigns 26

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EDITORIAL

AN OPEN LETTER—The Itinerant Rat Specialist

TO THE EDITOR OF "PESTS"—

SPEAKING on behalf of the National Pest Control Association and, we believe, for the Pest Control Industry at large, we feel that prominent space should be given to a matter which has come to our attention quite frequently, and especially so in the last few years. We refer to a type of individual who, for want of a better name, might be called an **itinerant rat specialist.**

We might also preface our remarks by saying that our information indicates that local Health Departments, especially in the smaller cities, appear to be either the "victims" of this type of itinerant rat "specialist" or perhaps see in the idea of using this type of individual, an opportunity for publicity leading to some sort of political advantage. We are almost tempted to say that we have no sympathy with either position just ascribed. On the other hand, there also rests some responsibility on pest control operators in not taking a more active part to stamp out the nuisance.

Permit us, first, to present the problem and the technique that is employed by this type of "rat specialist":

(a) He is not an individual about whom it can be claimed that he is incapable of performing good services or even using inferior methods or chemicals.

(b) He has, as a rule, good personality and a "smooth" manner in presenting the possibilities of a rat campaign accomplishing wonders.

(c) He will carry with him credentials that would make it appear that he was appointed as a temporary officer connected with Health Departments, or at other times, letters of endorsements from Health Officials. This list of credentials increases, as from city to city he travels adding to his portfolio.

(d) Certain services are usually rendered free of charge but in connection with these services of "education" or "free work in certain governmental owned properties," the appointment as a special inspector or letter of endorsement serves the purpose of selling products or commercial services to industrial plants and property owners. The promises in connection with this latter work for which money is collected are at times vague and at other times carry with them the obligation of a time-guarantee. In fact, there may even be presented another individual who is to continue with this work after the initial campaign has been conducted, the purpose of which is obvious; namely, the attempt at giving assurances that "guarantees" that are made will be fulfilled, even if the King Itinerant goes to another city.

(e) Local pest control operators who have been servicing properties begin to see their pest control service arrangements with industrial buildings and other properties cancelled or temporarily discontinued and at this point the competent local pest control operator begins to make inquiries. This is generally the "signal" for the itinerant to depart from the city where he is conducting a campaign because an investigation may disclose unsatisfactory situations where he has been working his plan in other cities or more to the point, he will not be collecting so much from then on.

(f) Health Officials who have been a "party" to lending encouragement to the itinerant "Rat Specialist" naturally become reluctant to admit that they have been in error so that a period of "stalling," "investigation," and what not enters the picture at this point. This likewise gives ample opportunity for the itinerant to pack up and leave town.

(g) The summary is simple: The itinerant has done some good work in places where it was necessary to have proper references; he has collected quite a little money from others and made an appearance as if doing good work; he has made promises about year-guarantees or results, and having left town, these cannot be carried out; he has brought disrespect to the industry in that the public looks upon all pest control operators as being the same and, possibly even worse, when it is considered that he was given the "blessing" of the Health Officials.

It is a simple matter to find fault and it is only natural that one would ask, "What are we to do about a situation like this?" Our purpose, then, is to offer a few definite suggestions.

1. Take a copy of this open letter and submit it to your local Health Departments, providing similar copies to such agencies as the Better Business Bureau, Manufacturers and Merchants Associations, and Chambers of Commerce with request that as many individuals are offering to conduct campaigns of this kind, a careful investigation should be made of every reference that is being offered. There are always two or possibly more cities where there has been a degree of success and a willingness on the part of the officials in these places to say a good word, but one should insist that the entire portfolio be checked.

2. Suggest that the office of the National Pest Control Association be consulted and possibly there is on record some information that will assist in the investigation being made.

3. You as local pest control operators or as a group of pest control operators, pay taxes in your city; conduct business from permanent places of business and addresses; must of necessity meet promises that are made or soon will have the law after you; are in position to do everything that an "outsider" can perform. In short, the local pest control operator should insist that if the Health Department officials are contemplating using an "outsider" that the following be made the matter of public reference:

(a) Evidence of investigation of past performances elsewhere and what these experiences have been.

(b) Evidence of financial responsibility to prevent a person collecting money and then skipping town.

(c) An opportunity as a bonafide resident pest control operator of a city to be given an opportunity to do this work.

4. Provide copies of this letter to neighboring cities along the lines suggested in Number 1 above, because quite frequently in the smaller centers there may not be resident commercial pest control operators but you, as a bona fide operator in the nearby city, are willing to stand investigation as to your integrity and ability to perform.

5. Be scrupulous about the services that you render at all times so as to cast no reflection on an important industry that acknowledges it has a big public service to perform as a line in defense of public health.

6. If there is a situation that requires greater attention the Bureau of Biological Survey is in position to give valuable cooperation to the pest control operators. As an industry, we recognize the fundamentals of sanitation being the important factor in that places of breeding should be reduced entirely, or to a minimum; that rat proofing is an important factor; that actual exterminating operations be left to the commercial pest control operator who acknowledges and uses what research has developed and by experience is competent to render satisfactory services.

The very nature of our industry calls for constant vigilance to stamp out the rat; that is our profession. By similar token we are jealous that no fly-by-night or itinerant bring adverse reflection on our industry. The National Association pledges its cooperation with Health Department officials to the end that the pest control industry can and will perform work of this nature as it should be done.

Very truly yours,

WILLIAM O. BUETTNER,
Secretary, National Pest Control Assn.

Another Slant on Rat Control Campaigns

FOR the purposes of illustration we would like to ask you to imagine for a moment a political entity entering a certain locality and causing a proclamation to be made that for the health of the community certain drastic steps were to be taken. It had been ascertained that sickness, especially common colds were much too common and impaired the efficiency of the community. The political authorities had come to the conclusion that the direct cause of this was low resistance. They had also decided that treatment was not prompt enough. They believed that the situation could be remedied—they felt there was no justifiable excuse for it and they proposed to do something about it.

Now here is the picture (all supposition of course)—an epidemic of colds in a certain community—the political powers naturally concerned about it and definitely proposing to do something about it. Nothing strange about this and certainly commendable enterprise on the part of those responsible for the administration of affairs.

Let us continue: Suppose that the politicians decided on a spectacular and apparently reasonable procedure, one that presumably would quickly eradicate the trouble. Their solution would be to hire a group of men, give them brief instructions in the value of a laxative, rest and proper diet, and then send them out

to go through the populace with their brief and novitiate knowledge with the aforesaid purpose of eradicating colds. The announced purpose would be to seek out the sick and treat them to clear up their colds and prevent the more serious complications such as flu, pneumonia, etc.

Can you imagine the wail that would arise from such a procedure? Can you hear the medical profession howl and the enlightened laity set up a roar of protest? And we would add our howl to the rest for while the goal was commendable, the plan of accomplishment was all wrong.

What has all this preliminary day dreaming got to do with Pest Control? We believe that the above fictitious circumstance exactly parallels the situation confronting our industry. The goal of a ratless community is one that even pest control operators subscribe to. No one realizes more than they the value of such a condition but while we concur heartily with this ideal, we condemn most earnestly the way in which the attempt is being made to carry it out. In the fictitious health campaign a policy of health information such as is carried on by public health groups, through newspapers, pamphlets, etc., would have been the ideal method to have followed instead of sending out men to treat the sick. And here we enunciate a principle worthy of foot-high letters. In campaigns such as mentioned above, i. e., health, rat, or any other of like nature, the ground work should be education and information of a preventive nature. LEAVE THE ACTUAL WORK TO MEN QUALIFIED AND TRAINED TO DO IT, and by qualifications and training, we mean just that, not the superficial knowledge of a few days' hasty information.

In the factual instances of rat campaigns the proper attack would be sanitation methods, educational instruction, etc. The actual work should be carried out by men and organizations trained and qualified by experience to do it.

Much has been said of this in the past but it can truthfully be said that the failure of these campaigns to cease can be attributed in large part to the lack of resistance on the part of the pest control operators as a whole. If such campaigns should begin to sweep the country, which is not beyond the bounds of possibilities, pest control operators would be aroused to a frenzy which would doubtless be effective. But certain localities are being harassed by such campaigns and P.C.O.'s should unite to prevent their spread and to wipe out such ineffectual, (proven) unfair methods of approach to a solution of the problem.

PESTS is convinced of the definite unfairness to and infringement on the rights of P.C.O.'s in such campaigns. PESTS expects to raise its voice against this practice and believes every P.C.O. should arouse and bestir himself in an effort to protect the rights of our industry. We are not out of sympathy with these projects. We feel that they are commendable and deserve whole-hearted support but all efforts along this line should be confined towards education and not actual treatment by unqualified and incompetent workers.

What We Mean by "P. C. O."

What We Mean by

"REDBROOKE"

The word "Redbrooke" is the only superlative in our vocabulary. We shrink from telling you that a dress is miraculous, marvelous, superb . . . even though we are sometimes tempted to do so. Instead, we quietly label it "Redbrooke." We are not lavish with the name. We guard it jealously. But should you discover it on your hose . . . your dress . . . your hat . . . consider it our unconditional guarantee of quality. And all "Redbrookes" are, of course, entirely exclusive with us.

SAKS AT 34TH—*THE FRIENDLY STORE*

We are indebted to "Saks" for an editorial. They will hardly object to our reprinting, verbatim, the above advertisement from a New York newspaper.

Where does pest control come in? Well, we started to paraphrase, substituting "P.C.O." for "Redbrooke." It was too easy; we quit. If you MUST have the editorial, write it yourself.

A brilliantly successful merchant; an intensely competitive product; the favored weapon, not superlative, but RELIABILITY.

Give it a thought. And what about your own advertising, Mister P.C.O.?

Open Letter From the Omaha Group

Omaha, Nebraska,
November 16, 1938.

INNUMERABLE complimentary letters are being received from you who attended the recent convention, containing many kind words about the work of the Omaha group in connection with activities in general. We would like very much to answer each one of these letters individually but we take this means of expressing to you collectively our appreciation of your kind expressions.

The general outline for our part in the convention was, of course, laid out for us, and some of the praise should go to our Past President, H. K. Steckel, and his good wife; Walter S. McCloud, 1938 National Convention Chairman, and William O. Buettner, the National Secretary, who put a great deal of thought and effort into the preliminary plans as well as assisting us in carrying them out. In passing let none of us forget the difficult assignment so graciously accepted and efficiently fulfilled by Louis Gatto. To all who had a part, our thanks.

We are happy to know that you enjoyed your stay with us and we will ever look forward to your return.

Cordially yours,

Mr. and Mrs. Joseph W. Hahne,
Mr. and Mrs. Mathias F. Levenson,
Mr. and Mrs. Hugh Hague,
Mr. and Mrs. H. R. Kelso,
Mr. Ward Combs, and
Mr. and Mrs. John Potts Linn.

A Problem for the Future

THE California Pest Control Association, through its monthly bulletin, printed a thought which is being given serious consideration by the National Pest Control Association. The problem is not an easy one but the thought was so well expressed that we reprint it verbatim.

One of our Association members writes, "I recently was asked to submit an estimate on a termite job so that the owner could have competitive bids—an insurance company loan being under negotiation. Was told by insurance man that X had put in a bid, also that he was paid for the inspection. I suggested that if they would turn over to me the original inspection specifications or recommendations perhaps I could put in a bid that could be correctly compared. The insurance man was ready to admit that without good specifications there could be no true comparisons in submitting a cost estimate."

O. K., fellow! Maybe you've got something there. However, we cannot lose sight of the fact that the most important factor in submitting correct and intelligent specifications is STANDARDIZATION OF METHODS and the adoption of APPROVED MATERIALS to be used on the job. Most of us know that even with experienced operators it is difficult to get two persons to agree on methods and materials to use for correcting any one existing specific infested property—that is, it is difficult unless the two inspect the property at the same time and while on the property come to an agreement on each detail.

It is quite a different picture when one inspector after another inspects that property without knowing what the other fellow's ideas are when the various recommendations are finally submitted. It seems that the best cure for this very common difficulty may be found in STANDARDIZATION, and this subject of standardization is to become more and more important as time goes on. At the Oakland Convention a good part of the business to be transacted will deal with STANDARDIZATION OF METHODS for termite treatment, repairs on structures and for various types of other pest control work.

Omaha Convention

We appreciate that many would like to have more of the details and addresses delivered at the Sixth Annual Convention of the National Pest Control Association. We assure you that further material will appear in the January issue of PESTS. The delay in receipt of stenographic notes has made it difficult to provide any of the major addresses. Dr. Snyder's "Questions and Answers" will appear in the January issue.

We appreciate the courtesy extended by the American Journal of Economic Entomology to permit us to publish two of the addresses delivered before the Eastern Branch of the American Association of Economic Entomologists recently held at Baltimore, Maryland. Others will be published later.

Relations of Entomologists and Pest Control Operators

By J. J. DAVIS, *Purdue University, Lafayette, Indiana*

EDITOR'S NOTE: *This address was delivered before the Tenth Annual Meeting of the Eastern Branch of the American Association of Economic Entomologists, Baltimore, Md., November 17, 1938.*

THE SUBJECT you have assigned me has been discussed on other occasions and I will doubtless repeat some of the comments previously made, but at the same time I hope to bring to you some new thoughts to emphasize and corroborate earlier comments.

As you are aware, economic entomology as a science is perhaps not more than 70 years old. To be sure we had economic entomologists previous to 1870, but the interests of entomologists before that time dealt largely with taxonomy and distribution of species. On the other hand we have authentic records to show at least one national commercial pest control organization that was doing business 78 years ago. Not a few commercial exterminators, or pest control operators as we now call them, have been operating for 50 years. Practically all, if not all, however, have operated in the larger cities, and the entomologist has had little or no contact with them. These earlier operators were apparently providing a needed and worthwhile service. Why, then, is the entomologist now interested in the work of of the commercial pest control operator? Since inaugurating the P. C. O. Conference at Purdue University in 1937 I have been asked why I have taken the time to cooperate with the P. C. O.'s and why I am interested.

A little historical study will perhaps be necessary as a background to answer the queries set forth.

In the beginning there were a few conscientious operators in the larger cities who were giving a good service. As conditions in cities became more crowded; as household insects became more evident; as people became more insect-conscientious, more "resentful" to insect invasions, and became educated to the fact that insects were important factors in health and well-being, they demanded freedom from insect annoyance in their homes, especially if they be city apartments and hotels. I can look back on the time that a bedbug or two in my hotel room or scintillating cockroaches were not uncommon and gave little concern. Today our attitude is changed. We advise the hotel clerk of such conditions and perhaps will seek another temporary shelter when visiting that city again. As a result of our changed attitude the apartment and hotel owner recognizes the necessity of eliminating these annoyances. The result of all this is an increased demand for the services of the pest control operator. This in turn opened the way for many mediocre operators to enter the field until this industry lost ground and was looked upon by many as a sort of racket. With the notoriety given the 50-million year old termite, more persons found this field profitable and at the present time the racket is in full swing.

In October, 1935, I attended the annual meeting of the National Association of Exterminators and Fumigators (now the National Pest Control Association) at Detroit, which had organized only two years before. I attended this meeting of my own accord to learn more about the men in an industry which was considered little more than a racket. I became acquainted with men who impressed me as being men of high caliber and honesty. They were men who recognized the short comings of many who had entered the field of pest control and who were attempting to build a much needed industry and develop ideals, which were essential for permanency. I had faith and when invited to talk at their next meeting in Cleveland in 1936 I discussed the goal of the pest control operator. Incidentally I mentioned the possibility of holding a short course or conference for Indiana operators. Because of the many requests we provided such a conference in January, 1937, and opened it to any commercial pest control operator in the United States or Canada who wished to attend. The response was unbelievable and we had 78 persons from 14 states. At Purdue we have had experience with many types of short courses and conferences, but never have I found a group of persons more eager to aid themselves. When the hour for each session arrived every one was in his seat and even seemed reluctant to leave at the close of each session. Such a response was evidence that those in attendance were interested and desired to improve their service. The demand for a second conference from such a group of persons could not be denied and so we continued the conference in January, 1938, with 103 persons from 22 states and Canada attending. The third conference will be held in January, 1939. We hope to avoid too much duplication and make the conference one which will add to and have continuity from year to year.

May I add that the conference could not have been successful had it not received the complete support of the National Pest Control Association, the Federal Bureau of Entomology and Plant Quarantine, the federal Bureau of Biological Survey and entomologists from nearby states.

Last March a similar conference was provided at Stanford University for the pest control operators of the Pacific coast and the interest was as great as at Purdue. The Pacific coast conference will be continued in its second year this coming February and it is anticipated that a similar conference of the operators in the southern states will be inaugurated in Louisiana this coming spring, and later as opportunity permits a fourth regional conference will probably develop for the eastern states.

In addition to the conferences, the National Pest Control Association has included in its annual convention activities, pest clinics and has been able to attract the services of entomologists, biologists, chemists, and public health officials, to develop this phase of their meetings. Thus we find that at the Omaha convention of the N. P. C. A. 22 technical entomologists, biologists, and public health authorities contributed to the formal and informal programs. These included 10 from the federal government and 12 from 8 different states. Some attended with a doubt in their mind as to the sincerity of purpose of these commercial operators, as I did when I attended the Detroit meeting in 1935. I believe I am safe in saying that even the most skeptical entomologist left the Omaha convention with a new picture of the P. C. O. industry and with the belief that the membership of the National Pest Control Association included a group of men with a desire to provide a needed service to the people and that they are sincere in their efforts to give a reliable service and are anxious to have the co-operation and assistance of technical organizations, including official entomologists.

What is a P. C. O.? The pest control operator, formerly known as a pest exterminator, is one who engages in the control of pests of the houses and of structures in general. In this category I would include termite control, control of pests in warehouses, mills, ships and the like, but perhaps more especially the control of insects and other animal pests in homes and service for the control and particularly prevention of such pests in hotels and apartments. In the broadest sense they are entomologists and as such should have a broad knowledge of the science of entomology. The majority are not men with a technical training in entomology although some of the most successful are entomologically trained. On the other hand we find that a large number are college trained men and as such have a keen sense of responsibility and ethics. However, it is probably true that the majority of pest control operators are neither entomologically trained nor have they completed a college training, but instead have learned the business from practical experience, that is, what we might call apprenticeship. And may I say further that some of our best and most trustworthy operators are in this last category. As I see it the pest control industry is at present in a stage of transition and within the next decade we will find it changed to a profession of high standing comparable with the profession or science of entomology and that an increasing percentage of operators will be entomologically trained men and women.

Relation Between Pest Control Operators and Entomologists. As I have stated before, I believe there should be a very close and cordial relation between the commercial pest control operator and the technical entomologist. Our close contacts with both groups leads us to the conclusion that technical entomologists will gladly help and foster the pest control industry if the latter maintains a standard comparable with that of entomology as a science, intelligently uses the results of research, and is honest and ethical in its work and service charges. On the other hand, we believe further, that pest control operators, who are members of the National Pest Control Association, on the whole, welcome co-operation which the technical entomologist can give them and are desirous of improving their services. Thus we conclude that an understanding of the pest control industry, and particularly the work and objectives of the National Pest Control Association, by the entomologists, as well as an understanding of the field of entomology and objectives of the American Association of Economic Entomologists by the pest control operators, will result in a better understanding between the two groups and in a co-operation so much needed to fulfill our dream of a great commercial industry, dominated by professional men and women of highest ethics and honesty, as well as ability.

In this connection, I would like to explain, primarily for the benefit of the pest control operator, just what constitutes an entomologist. In making the following comments, I am prompted in doing so by the expressed fear on the part of a few P. C. O.'s that

technically trained entomologists may attempt to dominate their industry. Furthermore, they have claimed that technically trained entomologists do not understand the practical applications of the results of their research. Personally, I believe that more and more, entomologically trained men will enter the pest control industry, and this will be one of the means of raising the standards and standing of that industry, and will doubtless greatly benefit the reputable operators. Just as the medical profession has developed into one of the highest attainments and ethics from the trade of a barber and the "quack," so will the pest control industry become a profession with ethics and achievements of which it may well be proud. Regarding the other point relating to the practicableness or artistry of a trained entomologist, it is true that many such see only the purely scientific aspects, but this is not true of most enomtologists who are in the economic or applied field. The pest control operator has reason for his belief that entomologists are not practical-minded, because very few entomologists have carried on investigations with household pests, especially as they occur in apartments and hotels, and fewer have ever conducted practical work to bear out the results of scientific research. This is due to lack of study of these particular problems, and not lack of appreciation of the practical aspects of insect control. The economic entomologist must carefully and painstakingly study the life history and habits of the insect, and with this information as a basis, formulate theoretical controls. These he must investigate with cage and small plot tests, but before he can finally make recommendations, the preliminary studies must be carried to the commercial field where large plot experiments are conducted. Even then, there may be some doubt as to the practicableness of the remedy, and he usually finds it desirable to offer his recommendations to a few selected parties operating on a commercial scale to determine whether or not the remedy is practical in the hands of the average user, before he feels safe in making final recommendations. The economic entomologist must be practical in his work, and the only reason his recommendations or his operations against household pests are so often impractical is because this is a field in which he has done little work, and he has not applied a practical mind to the problem. In other words, because one has received a technical or scientific training in entomology does not disqualify him as a practical operator. On the other hand, the pest control operators are justified in their conclusions, for many of the recommendations for household pest control attributed to the entomologist are not practical from the viewpoint of a commercial pest control operator.

How Can We Co-operate With the P. C. O.? I believe the ball has started rolling and further I believe we must give the pest control industry credit for starting it on its voyage. I am inclined to believe they were the first to invite entomologists to their meetings and participate in their programs. The program prepared for this afternoon is a gesture on the part of the entomologists to co-operate. I can safely assure everyone here that there is every evidence of co-operation springing up over the nation between commercial operators and entomologists and I wish to give due credit to the National Pest Control Association for the initial and active part they have taken.

But getting back to the original question as to how the entomologist can further cooperate with the pest control operator. First I believe it is the duty of the entomologist to take every opportunity to become acquainted with the operators of his state. Especially, you should learn to know those who are giving a faithful service and assure them of your desire to co-operate. By the same token, the pest control operators should become acquainted with the official entomological services in their respective states and utilize these services when needed, but above all get acquainted.

Recently I sent a questionnaire to all states to learn what is being done in the way of publications and research on problems of interest to pest control operators. Briefly, the replies showed an insignificant amount of research and an enormous demand for information. Why this situation? Experiment stations have a limited amount of money for research. This is used for studies of problems for which there is the greatest demand. Agricultural organizations of one kind or another are active in demanding that this and that problem be solved and as a result the money is expended for the work most demanded by these influential organizations. There was hardly a reply that did not assure us that there was a real need for research. I only have to cite an instance to illustrate this need. At Purdue a study of cockroaches, among our commonest insects, was begun as a sideline. It soon became evident that each species had habits and activities sufficiently different to have an important bearing on control and that statements in literature on these age old insects were simply carried down from generation to generation with no thought of checking up, and so we found notable errors in most of the publications dealing with roaches.

Another rather striking statement made by many who answered the questionnaire was that they were referring major insect problems to commercial operators.

Joint Committee. There has been inaugurated a joint committee, now a standing committee, between the National Pest Control Association and the American Association of Economic Entomologists, to study and report on problems of mutual interest.

This committee has given preliminary consideration to a number of problems, and perhaps the most important is that relative to state legislation. The report of this committee, which will be presented at the Richmond meetings, will include very definite recommendations from which we hope a model law may be evolved, much as the model nursery infestation law, developed by a joint committee of the American Nurserymen Association and American Association of Economic Entomologists some years ago, and which is the basis of all present state nursery infestation laws. Incidentally, I will say that these recommendations will emphasize the need of consulting commercial operators in the respective states in preparing regulatory measures.

One of the recommendations adopted at the Indianapolis meeting was that the branch meetings provide a half day to problems of interest to the pest control operators, and that the P. C. O.'s in the vicinity who were interested be invited to attend. I am grateful to the Eastern Branch for following this request. They are the first to do so but I hope another year every branch will follow your example. You have with you today a fine representation of pest control operators and I sincerely trust the entomologists will make every effort to become acquainted with these men, just as they made it a special point to become acquainted with the entomologists who attended the Omaha convention.

Over Fifty Pest Control Operators Attend Baltimore Meeting

THE PEST control industry was well represented with over fifty at the Tenth Annual meeting of the Eastern Branch of the American Association of Economic Entomologists held at Lord Baltimore Hotel, Baltimore, Maryland, November 17th and 18th. The invitation to pest control operators to attend the meeting came about by recommendation of the Joint Committee of the National Pest Control Association and American Association of Economic Entomologists seeking a closer relationship between these two groups having so much in common. The entomologists place greater emphasis in the agricultural field but in recent years the public has become increasingly termite conscious, thus causing the field of structural pest control to receive greater attention by the entomologists.

Thirty-eight papers were delivered at the Baltimore meeting but of particular significance to the pest control operators was the symposium that was arranged by Neely Turner of New Haven, Connecticut. The progarm of interest to the pest control operators included the following:

SYMPOSIUM ON HOUSEHOLD INSECTS

Neely Turner, Chairman

12. **Relations of Entomologists and Pest Control Operators.**
By J. J. Davis, Lafayette, Ind.
13. **Common Problems Arising in Relation to Household Fumigations.**
By J. L. Horsfall, New York City.
14. **Hazards in Relation to Household Fumigations.**
By I. L. Ressler, Wilmington, Del.
15. **Control of Clothes Moths and Carpet Beetles.**
By E. A. Back, Washington, D. C.
16. **Recent Progress in the Chemistry of Pyrethrum Flowers.**
By H. L. Haller, Washington, D. C.
17. **Termite Control in Buildings.**
By R. A. St. George, Washington, D. C.
18. **Notes on Psocids.**
By E. A. Back, Washington, D. C.

Opportunity was given for questions following the addresses. Pests will publish the two papers on the subject of fumigation in the December issue and in subsequent issues the other papers will be printed.

H. G. Irving Sameth brought the greetings of the National Pest Control Association and was followed by William O. Buettner who mentioned some of the activities of the association. In addition to the goodly representation of the states of Pennsylvania and New York, there were also pest control operators from Maryland, Washington, D. C., New Jersey, Minnesota and Illinois. William O'Reilly, president of the Northwest Pest Control Association represented the Minneapolis-St. Paul operators and is taking a report back to his local association and Walter S. McCloud will report the meeting to the Chicago operators.

The papers that were delivered will be published in the American Journal of Economic Entomology.

Clyde C. Hamilton of New Brunswick, N. J., was elected to the position of chairman of the Eastern Branch of the American Association of Economic Entomologists for the ensuing year.

The Early History (1848-1918) of the Use of Derris as an Insecticide

By R. C. ROARK, *Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture*

IN VIEW of the present interest in the rotenone-containing plants, **Derris, Lonchocarpus, Tephrosia,** and **Mundulea,** it seems worthwhile to review the history of their use as insecticides. This has already been done by the writer for **Lonchocarpus** (Bur. Ent. & Pl. Quarantine E-367, mimeo. 1936) and **Tephrosia** (Bur. Ent. & Pl. Quarantine E-402, mimeo. 1937). In the present paper the use of derris as an insecticide previous to the work of McIndoo, Sievers, and Abbott (Jour. Agr. Research 17:177) in 1919 is considered. Since the publication of that work a vast amount of research on derris has been carried out, which will be reviewed by the writer in another paper.

Oxley (Jour. Indian Archipelago and East. Asia 2:641-660) in 1848 gave the first account in English of the use of derris as an insecticide. In describing the cultivation of the nutmeg he wrote as follows:

"There are several species of insects which lay their eggs on the leaves, but they are not all of equal importance; that which manifests itself by the discolorization of the leaf, and the larvae of which are embedded in the substance and not on the surface, appears the worst, but all ought to be carefully watched and removed or they rapidly spread and cause great havoc amongst the trees. For this purpose it is necessary to wash the leaves with a decoction of Tuba root, and syringe them by means of a bamboo with Chunam (quicklime) and water of the consistence of white wash, this adheres to the leaves and will remain even after several heavy showers, giving for the time rather an unsightly appearance to the tree, but making amends by clearing it of the larvae already alluded to."

Little (Jour. Indian Archipelago and East. Asia 3:678-681) in 1849 wrote on a disease attacking the nutmeg tree in British Malaya which he termed "nutmeg canker."

"Observing how the cuticle of the branches and stem was affected, I scrubbed and washed those parts with an infusion of the Tuba root in which was mixed certain quantities of sulphur and Bengal soap; but that had no effect."

Epp (Jour. Indian Archipelago and East. Asia 5:269-291) in 1851 described the use of derris as an insecticide in Banka (an island lying east of Sumatra) as follows:

"The juice of several species of wood, applied to the epidermis, is productive of painful blisters and in case of wounds it causes obstinate sores. Some of the roots, for instance the Juba (tuba or derris), which has a strong smell of musk, contain a benumbing juice, poisonous to fishes. It is used for destroying the tree lice, springtails and all kinds of vermin pernicious to vegetables. For this purpose the root is cut into pieces, soaked for some days in water and sprinkled on the plants."

Teijsmann (Nat. Tijdschr. Nederland, Indië 16:20), in a letter dated Buitenzorg, Java, September 18, 1857, wrote that the roots of akar toeba had been applied successfully for the dissipation of insects.

Hooker (Roy. Bot. Gard. Kew, Rept. 1877, p. 43) reported that some "tubah" roots sent from Singapore grew and proved to be **Derris elliptica.** In Singapore water in which these roots have been steeped is said to be a very efficient insecticide for gardening purposes.

In 1886 an anonymous writer (Pharm. Jour. and Trans. (3) 17:4-7), in describing the colonial and Indian exhibition at South Kensington, England, referred to a herbarium speciman there of **Derris elliptica** and gave a brief account of its use as a fish poison and arrow poison. Reference is made to the reports of Oxley and Hooker, and it is stated that "the root would doubtless yield an active principle and might prove valuable as an insecticide."

Christy (New Commercial Plants and Drugs, No. 10, p. 39, illus. London) in 1887 gave information taken from the Pharmaceutical Journal and Transactions on **Derris elliptica,** including Oxley's use of it as an insecticide.

In 1890 an annonymous writer (Pharm. Jour. and Trans. (3) 21:559-560) reviewed the work of Greshoff (Ber. deut. Chem. Gesell. 23-3537, 1890) on the chemistry of **Derris elliptica** and remarked that further experiments must be made to determine whether derrid (the active principle of **Derris**) could be used as an insecticide.

Dymock, Warden and Hooper (Pharm. Indica 1:471) in 1890 stated that **Derris uliginosa** Benth. was known in India to act as a poison upon worms and the larvae of insects which trouble the cultivator, whence the Marathi name "Kirtana," meaning "worm creeper."

Watt (Dictionary of Economic Products of India, v. 3, p. 80) in 1890 quoted Hooker (1877) on the insecticidal use of **Derris elliptica.**

Wray (Pharm. Jour. and Trans. (3) 23:-61-62) in 1892 wrote that in Perak **Derris elliptica** was used by Chinese market gardeners as an insecticide. The fresh roots were chopped up fine and then pounded and mixed with water, which became milky. The mixture was sprayed or brushed over the plants with a bunch of feathers. Wray expressed the opinion that the dried roots would be of little or no use as an insecticide and that the "tubain" must be extracted and converted into an emulsion or into some chemical combination easily dissolved in water. He suggested emulsifying the alcoholic extract of derris with potash soap, or mixing it with a fatty oil and saponifying with alkali to form an insecticide.

The Federated Malay States Department of Agriculture (Malay Peninsula Agr. Bull. 8:217) in 1898 reported that the decoction made by pounding the roots of **Derris elliptica** in water had long been used as an insecticide by the Chinese and other gardeners in the Malay Peninsula.

Westerman (De Tabakscultuur op Sumatra's Oostkust, p. 164, Amsterdam) in 1901 recommended a decoction of derris root as a spray for use against lice on tobacco on the east coast of Sumatra.

Daniels (Jour. Malaya Branch Brit. Med. Assoc., Singapore, (n.s.) no. 2:3-5) in 1905 reviewed what was known of the insecticidal action of derris in British Malaya. The Chinese cultivated tuba root (**Derris elliptica**), and it was a common article for sale in the markets of the towns. For some time it had been used most successfully for the destruction of bedbugs in jails in Perak. It was known to be useful in destroying ticks on dogs, and had been used successfully against lepidopterous larvae, and by others, in the main unuccessfully, to deal with termites. It was stated that protozoa, both amoebae and flagellata, are rapidly destroyed, as well as rotifera, nematode larvae, and the smaller nematodes. Insect larvae are destroyed less rapidly, but in the majority of instances within a few hours. Pupae are not affected to the same extent, and some coleopterous larvae and the larvae of dragonflies are only temporarily injured. A fragment of crushed fresh root can be used effectively under all circumstances under which kerosene can be used to destroy mosquito larvae. The effects on larvae in semisolid masses, such as dipterous larvae in cess pits filled with semisolid material, are local only. The active agent of tuba root is readily soluble in alcohol, but the alcoholic extract, well diluted, is less effective than the fresh root macerated in the same volume of water. Derris has no permanent effect on bacteria and fungi.

Schneider (Ztschr. Fischerei 13:1) in 1907 wrote that the tobacco growers in Sumatra used derris for the destruction of caterpillars and other pests of tobacco, for which purpose a strong milky suspension must be used.

Howard in 1910 (U. S. Dept. Agr., Bur. Ent. Bull. 88, p. 78) in discussing insecticides used against mosquitoes, wrote as follows:

"Decoctions and emulsions of **Derris uliginosa** have been recommended for larvicidal use, but experiments conducted at the Wellcome Research Laboratories at Khartoum show that while it has considerable potency it also kills fish and that even in regions where these plants are native the different species of derris have only a limited use as insecticides."

Hoover (Fed. Malay States Dept. Agr. Bull. 9:128) in 1910 stated that a rubber plantation had been freed from white ants with tuba, prepared by beating the root and mixing it with water. This mixture, whether strong or weak, did not affect the trees or other vegetation. If the infestation was light, the water was poured around the tree; if it was heavy, a little earth was taken away from the roots. In a note in reply to this article, the editor, H. N. Ridley, stated that tuba root had often been tried against termites, with more or less success. It would eject them temporarily, but, like other liquid insecticides, it was too easily washed out by rain.

Ridley (Spices, pp. 8-9, London) in 1912 wrote of derris as follows:

"Tuba root is one of the best insecticides and is the one most regularly used by the Chinese, in the Malay Penisula, for treating their vegetables and other crops. The roots are pounded up in water and the decoction poured or sprayed over the crop, where it will kill all caterpillars, grasshoppers, and other insects. It is perfectly harmless to any plants. The decoction is poisonous to human beings, but only when taken in large quantities, and risk from it in the case of any of our spice plants is infinitesimal."

Wood (Fed. Malay States Dept. Agr. Bull. 1:164-166) in 1912 described the use of derris for the control of three undetermined species of small caterpillars on cabbage in the Federated Malay States. Two

pounds of crushed root was added to 2 imperial gallons of boiling water, allowed to soak for a few hours, and then diluted 1 to 8 for spraying. This preparation also repelled ants from a bed of germinating celery without damaging the plants. Wood suggested a trial of tuba-root solution against the codling moth and the gooseberry maggot in England. Another suggested use was for bathing dogs, 1 quart of stock solution to 1 gallon of water. It readily killed fleas and ticks and did not irritate the skin, except when the dog had mange. Then on no account should it be used. The editor of the journal in which Wood's paper is published added the following footnote:

"The tuba plant is grown by Chinese in vegetable gardens and can be bought in the market of Kuala Lumpur where it has been sold recently in large quantity. It is extensively used by Chinese in vegetable gardens, not only as an insectifuge but also to keep cows and goats from eating the vegetables."

Strickland (Rev. Appl. Ent. (B) 1:18) in 1913 reported that **Derris elliptica** was being tried for killing anopheline larvae in Malaya.

An anonymous writer (Chem. and Drug. 85:384) in 1914 stated that **Derris elliptica** was employed in Perak as an insecticide for plants and cattle.

Campbell (Jour. Straits Branch Roy. Asiatic Soc. 73:129-137) in 1916 wrote that the Chinese used **Derris elliptica** extensively as an insecticide, especially for spraying pepper vines. Campbell prepared an extract of the fresh root in the same way that the Malay fishermen prepared it, that is, by pounding and soaking in water, and tested it on mosquitoe larvae. **Stegomyia** larvae were employed. Solutions weaker than 1-10,000 (1 gram of root to 10 liters of water) were not fatal, nor did they prevent the larvae from developing. At least two days was required for 1-10,000 solution to kill larvae; 1-5,000 killed them in about two days; 1-1,000 in one day, 1-500 in three hours, and 1-10 in one hour. Campbell concluded that much stronger solutions and much longer periods are required to kill mosquitoe larvae than to kill fish or tadpoles.

Howard, in his report as chief of the Bureau of Entomology, United States Department of Agriculture, for 1917 (p. 6), mentioned that experiments were being made with a very promising product, one of the so-called fish poisons, presumably derris. In his report for 1918 (p. 3) he announced that derris acts both as a contact and as a stomach poison. "As a stomach poison it is efficient against only a few insects, while as a contact insecticide it is efficient against a wide range of insects." This statement was based on the work of McIndoo, Sievers, and Abbott, which was reported in full the following year.

The insecticidal value of derris had come to the notice of McDougall Bros., of Manchester, England, at least as early as 1911. On April 27 of that year they filed application for a British patent, which was granted on May 28, 1912. In this patent, British patent 10,215/1911, and in British patent 3,204/1911, issued May 8, 1912; applied for February 8, 1911, they claim the use of compounds extracted from akar tuba **(Derris)** as an insecticide, sheep dip, animal wash, and verminfuge. The powdered root is claimed as an insecticide in British patent 8,322/1912.

United States patent 1,065,156, issued June 17, 1913, applied for September 8, 1911, covering the use of derris extract as an insecticide, was also granted the McDougall Bros. For preparing this extract benzine is mentioned as a suitable solvent and the solid extract can be mixed with soap, sulfur, or other ingredients and made into a paste, powder, or liquid in any known manner.

Proprietary insecticides containing derris extract were marketed in England and in Europe beginning about 1911, and references to their value are found in the literature.

Wahl and Müller (Landw. Versuchsanst. Augustenberg, Rept. for 1914) in 1915 reported that the preparations Katakilla and Contraphin (both made from derris by the McDougall Brothers) must be used at a greater concentration than recommended in the directions if they were to be effective against plant lice. Katakilla should be used at a concentration of 1 kilogram in 200 liters of water, Contraphin at 1 kilogram to 250-300 liters. These preparations were useless against the woolly apple aphid.

Wahl (Wiener Landwirt. Ztg. 66:267) in 1916 recommended a solution of 26 grams of Katakilla in 5 liters of water for the control of the larvae of the asparagus beetle **(Crioceris duodecimpunctata** L.).

Gunn (Union So. Africa Dept. Agr. Bull. 9, 16 pp., illus.) in 1918 reported that both nymphs and adults of the Bagrada bug **(Bagrada hilaris)** feeding on cruciferous plants in South Africa could be destroyed by spraying with ordinary Katakilla, 1 pound to 7 imperial gallons of water, or with a special Katakilla, 1 pound to 8 imperial gallons.

(Continued on Page 10)

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The insects and other organisms dealt with in the papers mentioned are as follows:

Organism	Effectiveness of derris as a means of control	Reference
Amoebae	Effective	Daniels
Ants	A repellant	Wood
Aphids:		
Plant lice	Effective	Wahl & Muller
Tobacco lice	Effective	Westerman
Tree lice	Effective	Epp
Woolly apple aphid	Ineffective	Wahl & Muller
Asparagus beetle (**Crioceris duodecimpunctata L.**) larvae	Effective	Wahl
Bacteria	Ineffective	Daniels
Bagrada bug (**Bagrada hilaris**) nymphs and adults	Effective	Gunn
Bedbugs	Effective	Daniels
Caterpillars on cabbags (3 species)	Effective	Wood
Caterpillars on tobacco	Effective	Schneider
Caterpillars on vegetables	Effective	Ridley
Codling moth	Use suggested	Wood
Coleopterous larvae	Temporary	Daniels
Dragonfly larvae	Temporary	Daniels
Flagellata	Effective	Daniels
Fleas on dogs	Effective	Wood
Fungi	Ineffective	Daniels
Gooseberry maggot	Use suggested	Wood
Grasshoppers	Effective	Ridley
Lepidopterous larvae	Effective	Daniels
Mosquito:		
Anopheline larvae	Under trial	Strickland
Larvae	Effective	Daniels
Mematode larvae	Effective	Daniels
Rotifera	Effective	Daniels
Springtails	Effective	Epp
Termites	Usually ineffective	Daniels
Termites	Effective	Hoover
Ticks on dogs	Effective	Daniels, Wood

It is interesting to compare our present knowledge of the insecticidal value of derris with that existing from 20 to 90 years ago. Whereas now derris is chiefly used as a dust (made by diluting the finely ground dried root with talc or other diluent) or in solution in an organic solvent (e. g., in kerosene fly sprays), its first use as an insecticide comprised spraying or brushing the diluted milky sap from the fresh roots. The early proprietary preparations of derris consisted of extracts made by extracting the dried roots with organic solvents. When these extracts were added to water, the active principles were precipitated; so the material applied to the insects was an aqueous suspension of the active principles. Although the use of the powdered root of derris was patented for insecticidal use as early as 1912, no reference to such use appears in the literature previous to 1919.

Derris is now recognized as effective for killing many species of aphids, bedbugs, fleas and ticks on dogs, moquito larvae, cabbage worms, certain ants, and the gooseberry maggot. It has not proved effective in a practical way for the control of termites, grasshoppers, or the codling moth. Many of our present uses of derris were discovered many years ago. For example, in 1912 Wood mentioned the control of three species of caterpillars on cabbage with derris. Today one of the chief uses of derris is to control three species of cabbage worms, namely, the imported cabbage worm, the cabbage looper, and the larvae of the diamondback moth.

Might not the present widespread use of derris as an insecticide have come about much sooner if the early literature on the subject had been considered?

They Can't Do That to Us!

Just noticed the Chicago Exterminating Company on Lincoln Avenue. Ye Gods! Have the Yankees established a Chicago branch office?

—Dorothea's Boy Friend.

Common Problems Arising in Relation To Household Fumigation

By **J. L. HORSFALL**, *American Cyanamid and Chemical Corporation New York City*

EDITOR'S NOTE: *This paper was read before the Eastern Branch of the American Association of Economic Entomologists at the Tenth Annual Meeting, Lord Baltimore Hotel, Baltimore, Md., November 17, 1938.*

FUMIGATION is one of the methods which man has devised to aid in the control of insects and several other pests. As the name indicates, it involves the release of a gas or of a material which will readily become a gas at normal working temperatures. The object is to provide a mixture of the gas with the atmosphere in such a concentration that the pest during the physiological process of respiration will take into its body an amount of the gas which will be toxic to it. From this it follows that the gas will be released in some space where it may be confined and, since the amounts of fumigants which may be economically employed are not sufficient to kill instantaneously, provision is made to confine the gas in the space for a given period of time. The fumigator always takes into consideration these two important factors of concentration and time of exposure.

As a result of experimental work and by experience it is known that all insects are not equally susceptible to the same concentration and time of exposure for any given fumigant. This may be seen from the experiments of Creel and Faget (1) who, in 1916, determined dosages and exposure periods necessary to completely kill several species of adult insects when these were fumigated under provisions for protection ordinarily secured by these insects under natural conditions. Their results were:

Potassium Cyanide

	Dosage	Exposure
Mosquitoes	0.4 oz./1,000 cu. ft.	15 min.
Fleas	2.5 oz./1,000 cu. ft.	15 min.
Bedbugs	5.0 oz./1,000 cu. ft.	1 hour
Cockroaches	10.0 oz./1,000 cu. ft.	1 hour

It should be noted that no intermediate dosages between five ounces and ten ounces of potassium cyanide were tested for cockroaches. In view of results obtained by other workers the dosage cited would appear to be high since no egg capsules were present. Indeed, all stages of the same insect are not equally susceptible to the same combination of dosage and exposure of a given fumigant. There is evidence that the eggs of bedbugs are killed with a lower dosage of hydrocyanic acid than it takes to kill the immature and adult insects. On the other hand, the eggs of cockroaches are more difficult to kill than young and adults because of the thick capsule which encloses the mass of eggs. Experimental work in our laboratory has shown that a dosage of hydrocyanic acid which will result in a total kill of the adults of the tobacco beetle, Lasioderma serricorne, is insufficient to give a complete kill of larvae. This is the same species of insect known as the tow bug, which is sometimes encountered by pest control operators infesting vegetable stuffing in upholstered furniture. Lindgren and Shepard (2) found that ethylene oxide was about nine times as toxic to the eggs as to the adults of Tribolium confusum. Cotton (3) also illustrated this point with reference to stored-product insects and various fumigants in the paper which he recently presented at the Convention of the National Pest Control Association. He has found that hydrocyanic acid is many times more toxic to eggs of confused flour beetle than it is to the adults for all exposures.

Insects may differ in their susceptibility to different fumigants so that the relationships of dosages of fumigants required to kill ninety-nine to one hundred per cent of the insects may not always be the same. In one case, Fumigant A will be ten times as toxic as Fumigant B to one species of insect; Fumigant A may be practically equal to Fumigant B in toxicity to a second species. Moore (4), although engaged primarily in a study of the relationship between toxicity and the volatility of organic compounds, illustrates this point in the killing concentrations which he determined for the compounds, using the housefly as a test insect. The data which are given in the table to illustrate this variation are taken from three sources. The results for the cockroach, Blattella germanica, and for the confused flour beetle, Tribolium confusum, are from our own laboratory. The insects were unprotected from harborage and the dosages are those for total kill in three days. The figures for granary weevil, Sitophilus granarius, are from Shepard, Lindgren and Thomas (5), calculated from mortality curves; those for the bedbug, Cimex lectularius, are from Busvine (6).

Table I

	Oz./1,000 cu. ft./4 hr.		Mg./ltr./5 hr.	
	Cockroach	Confused Flour Beetle	Granary Weevil	Bedbug
Hydrocyanic Acid	0.3	1.25	11.4	0.17
Chlorpicrin	4.0	8.0	21.0	
Ethylene Oxide	4.0	20.0	11.2	12.30

A dosage expressed as milligrams per liter may be transposed to ounces per 1,000 cubic feet of space by multiplying the dosage in milligrams by 0.9988 and for practical purposes they may be considered as equivalent. Data illustrating these variations, with special reference to insects infesting stored products, have been published by several workers, including Strand (7), and Neifert et al (8).

Since fumigation results depend on the concentration and exposure relationship it will be interesting to consider this with reference to fumigations for roaches and bedbugs. Allison (9) determined a toxicity curve for the cockroach, in unprotected condition, using hydrocyanic acid. His dosages, in ounces, and corresponding exposure periods in minutes necessary to produce 100 per cent kill follow: 0.425—180; 0.6—120; 1.1—75; 4.2—25. Dr. E. W. Brown, captain, Medical Corps, U. S. Navy (10), has published in the U. S. Naval Medical Bulletin the results of fumigation tests with ethylene oxide on bedbugs. The data were furnished to him by Dr. E. A. Back in correspondence. All stages including eggs, were killed in a 3-hour exposure with a

dosage of 8.8 ounces, adults in 24 hours by 1.5 ounces; in 1 hour by 1.5 pounds; and in 30 minutes by 2.5 pounds. On the basis of this information Dr. Brown carried on a series of fumigation experiments with Carboxide (a mixture of ethylene oxide and carbon dioxide), using adult bedbugs and cockroaches confined in protected locations. As a result of these tests the following series of dosages of Carboxide and different exposure periods were recommended for complete kill of both insects: 5 lbs.—3 hrs.; 3 lbs.—12 hrs.; 2 lbs.—24 hrs.

It is well known that the concentration of a fumigant inside of an enclosed space is less than that which is theoretically introduced even though a sample of the air-fumigant mixture is withdrawn and analyzed almost immediately after the fumigation starts. Leakage begins at once except in the case of extremely tight vaults. Adsorption and absorption by the material and furnishings in the room as well as by the surfaces of the walls starts at once. Concentration tests during fumigations on ships and in warehouses show that the actual concentration soon after the start of the fumigation may be only eighty per cent of the calculated dosage. An example of the way in which the difference in concentration between that which is theoretically administered and that which is actually present effects the kill, as well as the influence which harborage exerts with reference to the kill of cockroaches and their eggs has been shown by Dr. C. L. Williams (11). Exposure period in all cases was two hours and the dosages given were expressed as ounces of hydrocyanic acid per 1,000 cubic feet of space. Under laboratory conditions with the exposure maintained at full concentration throughout the exposure, in the absence of harborage—two ounces; under laboratory conditions with concentration maintained in the presence of harborage—four ounces; in superstructures of ships with provision for both leakage and harborage—ten ounces. Since the concentration declines, the question may be raised as to the reason for the use of long exposure in the case of certain troublesome insects. Gases diffuse so that the concentration will tend to become equalized in all connected spaces. The concentration of fumigant inside the tracheae of the insect is equalized with that outside of its body. As long as the insect remains in a fumigant-air mixture it is not possible for the fumigant to leave the body of the insect and the action of the fumigant continues. On the other hand, if the house is ventilated in a short period of time, the fumigant inside the body of the insect will diffuse into the air because the concentration of gas in the space outside of the insect's body becomes less than it is inside of the body. Thus, unless a high dosage of fumigant has been used to compensate for the short exposure period, the insect may revive.

At first glance all of these variables might seem to present a confusing picture to the fumigator. First the fumigant should be selected which will best handle the particular situation with which he is dealing. This may depend upon the question as to whether or not the fumigation is to be made in a separate dwelling or building which can be completely vacated or in a single room in an apartment building which cannot be entirely vacated. In the case where the building can be vacated, hydrocyanic acid or chlorpicrin could be used, whereas in the case cited above these would not be applicable, and Carboxide could be used. Other considerations such as cost, availability and tightness of the building are other factors which may influence the choice of the fumigant. Once the fumigant has been selected the question of proper dosage and exposure period arises. As indicated in the earlier part of this paper, it might seem, that in the case of a given fumigant, a considerable series of dosages and exposure periods would have to be considered with reference to each particular insect. Oftentimes all stages of the life cycle of an insect or of several insects may be present in the building. The technical workers in the field of household insect control, as well as the manufacturers of fumigants, have established a dosage and exposure period for each fumigant which might be called standard recommendations to take care of these conditions under ordinary circumstances such as tightness of building, temperature, ease of penetration, etc. For example, these standard recommendations for hydrocyanic acid are eight ounces of Discoids or sixteen ounces of sodium cyanide or Calcyanide for 1,000 cubic feet of space; for chlorpicrin one pound per 1,000 cubic feet; Carboxide ten pounds per 1,000 cubic feet. In all cases the normal recommended exposure period is 12 hours, although there may be special circumstances when this period may be shortened. These recommendations cover the control of cockroaches, bedbugs, silverfish, clothes moths, fleas, rats and mice. However, standard recommendations such as those which have been given for hydrocyanic acid and other fumigants may not handle special cases. The dosage may be

(Continued on Page 12)

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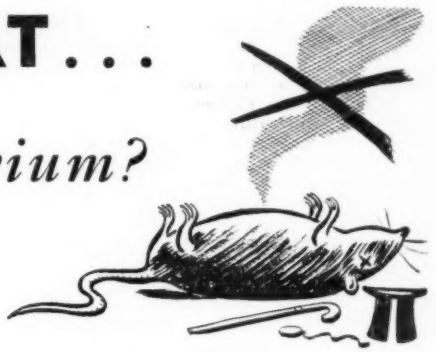

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increased and the exposure period may be lengthened to meet the special conditions involved. It is well known that the best results are obtained with hydrocyanic acid or any other fumigant at a temperature of 70 degrees F. or higher, and every effort should be made to carry on the fumigation at a temperature in that range. If the temperature is slightly below 70 degrees F. the concentration of the fumigant should be increased by using a higher dosage. Among other conditions calling for a higher dosage or longer exposure than normal are cases of leaky buildings, rooms with extra heavy draperies, rugs, and furnishings, and situations in which it is necessary to kill infestations of insects between the walls.

The fumigator may have certain situations to consider which are not ordinarily encountered in routine dwelling fumigation. Some of these special problems which arise in connection with the use of hydrocyanic acid are considered separately. Problems which may arise in connection with some of the other fumigants have been discussed by workers in various published articles who are familiar with their uses. In the discussion it is understood that whenever hydrocyanic acid gas is mentioned the situation is the same whether the gas is liberated from Discoids, sodium cyanide, or Calcyanide.

1. Temperature effect. In the early spring a dwelling was fumigated for bedbugs and clothes moths. A few weeks later a reappearance of the insects was noted. The fumigator had sealed the place thoroughly, used a sufficiently high dosage of hydrocyanic acid, adequate period of exposure and the temperature in the house had not dropped below 70 degrees F. When conditions, prior to the fumigation, were checked it was found that there had been no fire in the furnace for about one week because several moderately warm days had occurred, although the nights remained cool. Although a fire had been built the night before the fumigation was conducted so that the temperature inside the house was about 70 degrees F., the next day, the walls and space between the walls were cool. Insects, especially behind the baseboards, were in an inactive, dormant condition. Furnace heat was maintained for several days, the fumigation was repeated under the same conditions of dosage and exposure with the result that the infestation was eliminated.

2. Careful inspection before fumigation. A fumigator, using correct dosage of hydrocyanic acid, and correct procedure of sealing, exposure, etc., failed to eradicate an infestation of clothes moths. A few weeks after the fumigation, adult moths were flying about in the house. A careful inspection revealed a bundle of old clothing, tightly wrapped, in a corner of the cellar. When this bundle was opened live clothes moths in all stages of development were found. The fumigator had not put any gas in the cellar since he did not think there was anything to cause the infestation which he had found in furniture in the rooms above. He should have carefully inspected the entire premises from cellar to attic, insisted that all trunks, boxes, bundles, and closets be opened. In the case of bundles, the material should have been spread out so that it would be exposed to the gas. Care should be taken to see that the gas will get inside dust bags of vacuum cleaners.

3. Hidden infestation. The fumigation, according to correct procedure, was for clothes moths. Conditions following the first fumigation were similar to those in No. 2. Clothes moths were flying about. A careful inspection developed the fact that adult moths were coming into the room from a crack between the baseboard and the floor of the living room. The baseboard and plaster behind it were removed and it was found that moths had pupated in the material used as sound-proofing and insulation behind the plaster. The moths had evidently developed by feeding on wool lint in the cracks under the baseboards, and moved to the insulation materials to form the cocoons. The situation was explained to the owner, baseboards were removed and the house was again fumigated with good results. Of course, such a condition may, in time, reoccur if a new infestation of clothes moths are introduced into the house. The removal of baseboards with, sometimes, the necessity of opening up sections in the plastering is the only certain way of dealing with such a situation. The use of fans with non-sparking motors helps under such conditions. The alternate suggestion, which may be put squarely to the home owner, would be a series of fumigations, at three week or monthly intervals, entailing considerable expense and inconvenience. An instance is known where such a series of three fumigations cleaned up the infestation.

4. Distribution of gas. Unsatisfactory results, were obtained in fumigating a private dwelling for carpet beetle. The dosage of hydrocyanic acid, period of exposure, temperature, and other conditions were such that satisfactory results should have been obtained. The house was a large mansion with large rooms, having high ceilings, many large open halls and stairways. It was suggested that the fumigator install several electric fans with non-sparking motors, near the ceilings, aimed down, and revolving at slow or medium speed. The object was to direct the gas toward the lower parts of the rooms where infestation was located. The fumigation was carried out in this manner and the infestation was eradicated.

5. Reinfestation. Sometimes a dwelling is fumigated that adjoins another home. It may be one-half of a duplex house or one of a solid row of houses. An excellent kill of bedbugs has been obtained as far as can be determined after the fumigation. Within a few weeks a complaint is received that the pests have made their reappearance. Over and over again, when these cases have been investigated, it is found that the adjacent dwelling was infested and the reinfestation was coming from that source. Cracks in the common or party walls furnish easy paths for the migration of the bugs. Obviously the only remedy, as Dr. Back has often pointed out, lies in common action by the neighbors wherever it is possible to persuade them to fumigate at the same time.

6. Ticks in dwellings. Several instances of infestations of ticks have come to the attention of the writer during the last few years. In most cases the pet dog was infested and had been sleeping in the house. In one instance the dog had been sleeping on an overstuffed sofa and the only place in the room where the ticks had been found was on this sofa. While the focal point of infestation was in this piece of furniture it was deemed advisable to fumigate the entire house. The house was fumigated with a dosage of one pound of hydrocyanic acid per 1,000 cubic feet of space and an exposure of twenty-four hours. The dog was boarded out and treated until it was certain that he carried no more ticks. This fumigation resulted in a complete elimination of the ticks and indicated that the source of infestation was so situated that it was possible to readily reach it with the gas. On the other hand, we know of an instance in which an infestation of ticks was not eradicated with a two pound dosage and twenty-four hour exposure. In this instance the house was built on a wooded hill with the laundry, vestibule, and garage on the ground floor. After the place had been fumigated and aired, many dead ticks were found in rooms on this ground floor. Live ticks were also found and have appeared at intervals since that time. These were noticed crawling up a corner of one basement room coming from a crack between the baseboard and plaster. It seems probable that in this case the infestation was established in some place outside of the rooms. It is possible that there are burrows of field mice or ground squirrels which extend from the hills under the garage and the ticks have infested animals in these locations. At this time the final facts with reference to the actual source of infestation are not known. However, in any situation such as this, the only final solution is to locate the source of infestation from which the ticks are spreading into the house.

7. Discoloration of painted walls. A house was fumigated and ventilated. The painted walls in some of the rooms were found to be discolored. Investigation disclosed the fact that the relative humidity was very high during the fumigation and that, during the overnight exposure, there was a marked drop in temperature. Under such conditions, a condensation of moisture takes place and forms a film on the painted surface. The hydrocyanic acid gas is absorbed by the moisture and may form a reaction product of hydrocyanic acid which is yellowish-brown in color. Both experimental work and actual experience has shown that this discoloration will not occur if the relative humidity is 70% regardless of the temperature. If the relative humidity reaches 80% or above and temperature falls the effect is quite likely to occur. Therefore, if the humidity is extremely high, it would be a mistake to start a fumigation of 12 hours' duration in the evening, since, in all probability the temperature would be dropping during the night. If it is necessary to fumigate under high humidity conditions the fumigation should be started in the morning and extended through the day when rising temperature may be expected.

If freshly painted surfaces, such as walls or woodwork, which are not thoroughly dry, are exposed to the gas they may be discolored. Obviously the house should be fumigated before the painting is done or it should be delayed until the paint is thoroughly dry.

8. Discoloration of sinks, etc. Sometimes discoloration is found on sinks, bath-tubs, enameled kitchen ranges, and on kitchen walls. This is due to the absorption of hydrocyanic acid gas by the soap or grease and the formation of the brownish polymer of the hydrocyanic acid. The same thing may occur on the walls around lighting switches, due to natural oils from the hands left on the walls when feeling for the switch. This discoloration is merely a surface reaction and may be readily removed by the use of scouring powder and water, or by sponging the surface with a rag dampened in a dilute solution (50-50) of hydrogen peroxide and water.

9. Photographic Film. Not long ago a fumigator was called upon to fumigate a store in which there was a considerable stock of unexposed film. In looking over the premises, while estimating the cost of the work for the customer, he noticed these

films. He knew that hydrocyanic acid would have no harmful effect on any of the other stock which he noted. However, it occurred to him that he had better obtain information with reference to the films. Fumigations in our laboratory have demonstrated the fact that unexposed and undeveloped film will be fogged if they are exposed to hydrocyanic acid gas and it is advisable to remove them from a premises before a fumigation. This fumigator probably saved himself considerable trouble by obtaining this information from us and removing the films.

10. Proper Procedure With Heating Equipment. Various authorities have investigated the explosive limits of mixtures of hydrocyanic acid gas and air. The lower explosive limit placed by any of these is 5.6% volume concentration. An ordinary fumigation dosage of 8 ounces of hydrocyanic acid per 1,000 cubic feet is equivalent to .72 per cent HCN by volume. Even with a heavy dosage which may be double this figure the explosive limit is not reached. However, if fire should be present in a furnace a situation might be present whereby through carelessness of the operator materials for generation of the gas such as pots or Discoids would be located adjacent to the furnace. In this case there would be a concentrated amount of gas present which would be flammable and a flash might occur. Therefore, it is always recommended that fires should be extinguished before the fumigation is started.

It is generally recognized that HCN is a very toxic fumigant. Although, like other fumigants, it varies in its toxicity to different insects, there is an economic dosage which can be used for all of the insects which commonly infest dwellings. However, there are certain situations which may arise that might cause failure to obtain satisfactory results if they are not recognized and steps taken to correct them. These have been discussed in this paper with the thought that the fumigator will be better able to recognize such situations if they are called to his attention.

Such routine matters as sealing, the fumigation routine, and aeration, have not been discussed. They have been fully covered in bulletins published by the United States Department of Agriculture, various state experiment stations, and fumigant manufacturers.

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The cockroach smells and hears with its antennae. If a cockroach's leg is broken off, another immediately begins to grow in its place.

Plans Started for the 1939 Convention

Realizing the big task that lies ahead, The National Pest Control Association is hard at work to make the Seventh Annual Convention a big success all 'round. The Convention in 1939 will be held October 23-24-25 at Hotel Pennsylvania, New York City.

The National Convention Committee for 1939 is: Calvert P. Cissel, chairman, Washington, D. C.; Benj. U. Baker, Chicago, Ill.; George A. Rader, Berkeley, Calif.; F. E. Bohman, Hartford, Conn.; Walter S. McCloud, Chicago, Ill.; and William O. Buettner, Brooklyn, N. Y., with President H. G. Irving Sameth, ex-officio member. William J. Shrimplin of the Rose Rat Exterminator Co. of 154 Nassau street, New York City, is the local chairman.

Mr. Shrimplin's address is given in the event that any care to make suggestions as to local entertainment.

Discussion was had on the tentative program and from indications, the program will be stronger than ever. Many details will follow in subsequent issues of PESTS.

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Hazards in Relation to Household Fumigation

By I. L. RESSLER, *Entomologist - The R. & H. Chemicals Department*
E. I. du Pont de Nemours & Co., Inc.

EDITOR'S NOTE: *This paper was read before the Eastern Branch of the American Association of Economic Entomologists at the Tenth Annual Meeting, Lord Baltimore Hotel, Baltimore, Md., November 17, 1938:*

HYDROCYANIC acid gas was first introduced in California for the fumigation of citrus groves in 1896 by Coquillet, an investigator of the Bureau of Entomology. In 1898, it came into use for industrial and household fumigation at the suggestion of workers in the Bureau of Entomology. Its adoption, about 1912, by the United States Public Health Service for the fumigation of ships gave HCN gas even greater impetus for its use in industrial and household fumigation. Today, fumigation with HCN gas has become a science although its attendant hazards have not been fully recognized until within comparatively recent years.

Because of the hazards involved, both to operators and to occupants of buildings, the application of this gas for fumigation should be carried out only by trained men, familiar with its properties and action. This should be made a strict requirement on the part of all Pest Control Operators and others whose duties call for work in the fumigation field. Pioneers in the development of hydrocyanic acid gas for fumigation were truly brave men since they knew nothing about the material except that it was a deadly gas. Gas masks were unknown and precautions in the handling and use of HCN had to be worked out by trial and error. Scheele, who discovered hydrocyanic acid gas in 1782, lost his life while experimenting with the material in his laboratory. All those who work with hydrocyanic acid gas know that there are several sources of the material, and various methods of applying it. Briefly, these are: Liquid HCN which is applied from pressure cylinders from the outside of the building; liquid HCN absorbed in a porous, inert material which is applied inside the building; the powdered cyanides which are applied inside the building; and the generation methods, one of which is the pot method, applied within the building and the other, the cyanide generator by which the gas is applied from outside the building.

This discussion is to be devoted only to hazards in relation to household fumigation, a branch of the work which probably offers the greatest number of chances for serious mistakes. In dealing with this subject, consideration must be given to "Hazards to Operators, Hazards to Householders," "Recent Developments in Determining Concentrations of Hydrocyanic Acid Gas" and "A Brief Discussion of First Aid and Medical Treatment."

Hazards to Operators

As stated above, all fumigators should be familiar with the nature and action of hydrocyanic acid gas and every precaution should be taken to protect both the operators and occupants of the homes being fumigated. Each job should be well and critically planned and specific duties should be delegated to each man on the job. The responsibility for supervision of the entire job should be assigned to one man, from the preparation of the building until it has been declared safe for reoccupancy. Each assistant should know exactly his particular duty for each stage of the work. Operators who apply the fumigant, regardless of its source, are in a hazardous position until the fumigation is completed. In the course of this talk, I will attempt to cover the principal hazards that may be encountered but it will be impossible to go into great detail in the limited time at my disposal. There are so many variables in the application of HCN gas for fumigation that it may appear as though certain features may be slighted, or even lost sight of, entirely. Keep in mind, also, that the human factor also enters into the problem and that the practices of one group may vary widely from that of another. I will not discuss the hazards in the order of the various kinds and sources of material, as they were briefly described, but will call attention to such hazards as occasion calls for the mention of the various materials.

Pest Control Operators who use the pot method should exercise special care at various steps in the procedure. Workers who handle sulphuric acid should be provided with goggles and rubber gloves to guard against burns to eyes and hands. There are several cases on record where acid has spattered into eyes, causing total blindness. Fortunately, no such accident has ever occurred among fumigators, although there is an ever-present hazard. Only last month, I witnessed a case in which an operator had acid splashed into his eye while he was pouring it during a high wind. Immediate medical attention prevented permanent injury although the affected eye became very bloodshot and was quite painful for several days.

For handling sodium cyanide, rubber gloves, or a good grade of canvas gloves, should be worn. This is advisable to prevent contact with the skin to provide against the caustic action of the cyanide and poisoning, should there be any cuts or open abrasions on the hands. Likewise, gloves should be worn when handling the powdered forms of cyanide where those materials are likely to come into contact with the skin. The reason for this is due to the fact that these materials give off HCN gas when they react with air moisture, and accumulations of the powders on the skin may permit the absorption of gas released in this manner into the body.

Gas masks should be provided for every employee engaged in the fumigation operation. Where the gas is to be generated inside the building by any of the methods mentioned previously, all men doing the work should wear gas masks from the time the fumigation operation is started until they have left the structure. Great care should be exercised to see that masks fit properly and that the canisters are in first-class condition. Several accidents are thought to have been caused by not exercising this care, Canisters should be replaced frequently where they are subjected to continued use. Also, it has been claimed that unused canisters should not be employed if they are more than one year old. The recommendations of canister manufacturers should be closely followed on this point.

Where hydrocyanic acid gas is applied from outside the building, gas masks should be ready for emergency use at all times by fumigators on the job. A situation such as leakages at valves or connections, or a broken line, may occur which requires quick action and which can only be corrected by an operator wearing a gas mask.

Another hazard to operators lies in the absorption of hydrocyanic acid gas through the skin. This may occur on jobs where the fumigators are required to work in an atmosphere of the gas during the fumigation operations. Liquid HCN absorbed in an inert, porous material, the pot method and the powdered cyanides are all applied inside the building and fumigators are more or less subjected to the gas while working. Men, moist with perspiration, or wearing damp clothing, are subject to this hazard because the moisture will absorb the gas and the body in turn will absorb it, with an effect being quite similar to the actual breathing of the gas. There have been accidents due to both causes. I am familiar with one in which three men were overcome. They were perspiring heavily and applying absorbed liquid HCN in a building in which the temperature was over 100 degrees. Another accident occurred where men, wearing rain-soaked clothing, were applying gas within the building. The gas was absorbed in the clothing and, upon completion of the job, the men went into a dry, heated room and the heat caused the gas to evolve, overcoming several of the men. Fortunately, no fatalities occurred in either of these accidents.

Finally, the operators encounter hazards when they enter a building to ventilate it. It is still too common a practice to send men in to open up doors and windows without being protected by gas masks. It should be made a rule that all workers entering a building to ventilate it following exposure to hydrocyanic acid gas, should wear masks. After the building has been opened, no man should be permitted to venture into the building without a mask before it has aired for at least two hours. Even then, whoever enters the building should carry a gas mask for emergency use. The clean-up in the building, which is usually carried out during the ventilation period, should be followed with caution for several of the methods. In the case of the pot method, care should be exercised not to agitate the residues in the pots, for frequently sufficient gas can be again generated to cause a serious accident to workers carrying the pots. Likewise, liquid HCN or the liquid HCN absorbed in porous material, and the powdered cyanides, present hazards. The first two products may be condensed to liquid, or even to a solid icy-like material, if the temperature during the exposure period has dropped considerably below the boiling point of the gas. As the temperature of the building is then increased to 80 degrees, this liquid, or solid icy material, will volatilize and frequently give off gas in sufficient quantities to cause a serious accident. The powdered cyanides never give off all of the available HCN gas during a normal exposure period and care should be exercised in gathering it up not to breathe the fumes, or permit it to dust through the premises.

Hazards to Householders

The most serious hazards to householders occur after the fumigation and are usually due to faulty ventilation. Before the fumigation, all occupants of the home

should be notified sufficiently in advance of a job so that they can make arrangements for quarters during the time the house is in the hands of the Pest Control Operator. On the day of the fumigation, the operator in charge of the job should be responsible for the complete evacuation of the structure to be fumigated. No one but employees of the Pest Control Operator should thereafter be permitted to enter the building until it has been declared safe for reoccupancy.

After the actual fumigation operation, and when the building has been locked and properly placarded, a watchman should be stationed on the job, charged with the responsibility of preventing anyone from entering the building. Accidents have occurred from this cause despite the fact that a watchman has been present and the building has been placarded and locked. The watchman should be familiar with the nature of the work which has been done and should be acquainted with the possible use of a gas mask which he should have on hand for emergency use. The building should be kept under guard until it has been turned back to the householder. For large buildings, such as apartment houses, two or more watchmen may be required. Too little consideration is still given to the placing of watchmen on jobs by many Pest Control Operators. It should be made a part of the fumigation standard practice. Keep in mind that there are, and always will be, people who do not believe in signs such as:

DANGER!!!
THIS BUILDING IS BEING
FUMIGATED WITH HYDROCYANIC
ACID GAS
A DEADLY GAS
KEEP OUT!

After a building has been opened for ventilation, the real hazard to the householder begins. The fumigator in charge of the job must be responsible until he is certain that the free space in the building and bedding, upholstered furniture, and other articles which may absorb and hold toxic concentrations of the gas for long periods, are thoroughly freed of it. His responsibility is a serious one. Bedding, upholstered furniture, and the like, should be kneaded and squeezed again and again until it is assured that they are free from gas. They should be allowed the maximum of fresh circulating air and it is often advisable to do much of the airing outdoors. Many of the fumigation accidents reported during the years past have been caused by improperly ventilated bedding.

Drops in temperature during the exposure period may also give rise to hazards to householders. When the temperature drops below the boiling point of HCN, the gas will condense on walls and other surfaces, in bedding, upholstered furniture, and other materials in such manner that ordinary ventilation will not readily clear out the gas. The premises may be aired and thought to be completely free from gas, but when the home is heated, the gas which has condensed may be given off in toxic concentrations. Even the warmth of the body is also sufficient to generate toxic quantities of HCN from bedding and mattresses. A number of accidents have been caused from the body warmth of sleeping persons causing condensed, or absorbed gas, to volatilize after it was assumed that the premises were properly ventilated. Time does not permit going into detail on this subject which was fully discussed at the Omaha meeting of Pest Control Operators by Dr. C. L. Williams (Assistant Surgeon General, United States Public Health Service. His paper will be published in an early issue of "PESTS" and will be available for general information. (Editor's Note: The address by Dr. Williams was published in the November, 1938, issue of PESTS.)

At this point I would like to discuss the practice of fumigating a single apartment with hydrocyanic acid gas. Some fumigators, in doing this type of work, order all apartments that are immediately adjacent to the one beng fumigated, to be vacated. By adjacent, I refer to those apartments immediately above and below and on each side of the one which is to be treated with hydrocyanic acid gas. Occasionally, a fumigator will be found who will attempt to fumigate an apartment without ordering any near-by apartments to be vacated. Each of the practices just mentioned should never be followed. From our knowledge of the behavior of gases, there is no assurance that other inhab.tants of the building will not be effected by the seepage of gas throughout the structure. Pest Control Operators should require the evacuation of an entire apartment house before undertaking the fumigation of any portion of it with hydrocyanic acid gas. Further, if household pests are present in one apartment, they are more than likely to be present in other apartments in the same building, thus making it advisable to fumigate the entire building to prevent reinfestation.

The question of how long a Pest Control Operator should hold a home when it has been given to him for a fumigation has often been raised. Because of greatly varying practices, it is difficult to lay down hard and fast rules, but certain remarks

(Continued on Page 16)

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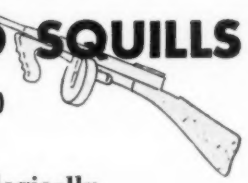

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on this point may be timely. Ordinarily, homes are turned back to the householder in from 10 to 12 hours and, occasionally, in as short a time as 8 hours. It is rarely possible to fumigate and ventilate a building properly, even within a 12-hour period. Pest Control Operators should have a home at least 24 hours in order to be reasonably certain that a thorough job has been done. Many operators now insist on the 24-hour period. I have even seen homes that could not be reoccupied within 36 hours from the time they were opened for ventilation. This may be explained by the fact that outdoor temperature, humid or rainy weather, and other climatic conditions, together with the dosage of gas used in the fumigation, may require more time in which to bring about proper ventilation.

Detection of HCN Gas

A new device has recently been placed on the market which enables fumigators to determine concentrations of gas in air far below the fumigation concentration. This device should prove very helpful in aiding the Pest Control Operator to reach a decision as to when a building is thoroughly ventilated. Not only can direct readings of the concentrations of HCN in the free space be made, but it can be used also to determine the concentration of gas in bedding, mattresses, upholstered furniture and other materials containing air spaces which may tend to absorb hydrocyanic acid gas.

The device consists of a metal fitting with a tubular inlet on one end and a bulb on the other. The fitting is equipped with a scale on which direct readings of the concentration, ranging from zero per cent to one-tenth per cent (0% to 0.1%) with the lowest reading above zero being five-one-thousandth per cent (0.005%) or fifty (50) parts per million in air. A glass ampule, with the ends broken off, is placed into the fitting in such manner that air can be drawn through it. The reading on the scale will indicate the per cent concentration of gas in air.

For taking readings in mattresses, upholstered furniture, and the like, a coarse hypodermic needle, such as those used by embalmers, can be placed on the tubular end. The needle is then inserted into the mattress, or piece of furniture, and a sample of the air drawn out. As HCN air mixtures are drawn through the ampule, which contains an absorbent material impregnated with a chemical which reacts with HCN gas, the chemical will turn blue. The length of passage of blue coloration in the ampule will indicate the concentration which can be read on the scale directly opposite the ampule.

As yet, no one has ever gone on record as to what constitutes an entirely safe concentration of HCN gas for humans. It is safe to assume, however, that the reading should be close to the zero per cent mark before the building is declared safe for reoccupancy. McNally states in his book "Toxicology" that a human can inhale air containing 50-60 parts per million of hydrocyanic acid gas for one hour before feeling any ill effect. His references are taken from the work of R. Kobert entitled "Kompendium der Proktischem Toxicologie."

First-Aid and Medical Aid

The treatment of cyanide poisoning is properly divided into two parts, i. e., First-Aid and Medical Aid.

First-Aid is the prompt action which is taken to prevent further harm or death and to put the victim of the accident in the best condition for later treatment. First-Aid is generally given by the layman before the doctor arrives.

Medical aid is the treatment given only by the physician.

First-Aid and Medical Supplies

Always have on hand the following:

For First-Aid—

One carton of amyl nitrite pearls.

For Medical Aid—

Two ampules of sodium nitrite, each containing 0.3 gm. in 10 cc. of water (3 per cent).

Two ampules of sodium thiosulfate, each containing 25 gm. in 50 cc. water (50 per cent).

Two 10 cc. sterile syringes.
Two 50 cc. sterile syringes.
Two sterile intravenous needles.
One tourniquet.

First-Aid

Procedure for First Symptoms—

1. Stop working with hydrocyanic acid gas.
2. Go into fresh air immediately.
3. Inhale the contents of an amyl nitrite pearl.
4. Lie down and breathe deeply until all symptoms have subsided.
5. Be far enough removed from source of HCN to avoid gas-laden air currents.

Patient Still Conscious—

1. Remove to fresh, gas-free air.
2. Have him inhale contents of one amyl nitrite pearl.
3. Have him lie down and breathe deeply until all symptoms have subsided.

Patient Has Fainted—

1. Immediately have a physician called.
2. Remove to fresh, gas-free air.
3. Have him inhale contents of one amyl nitrite pearl.
4. Have him inhale pure oxygen, if available.

Patient Completely Unconscious—

1. Immediately have a physician called.
2. Remove to fresh, gas-free air.
3. Loosen garments, especially around the neck, but prevent chilling.
4. Have him inhale the contents of an amyl nitrite pearl.
5. Have him inhale oxygen.
6. If breathing has ceased, combine inhalation of oxygen with artificial respiration, using the Prone Pressure method until the physician arrives.

Medical Treatment

Always have on hand the following:

1. One carton of amyl nitrite pearls.

2. Two ampules of sodium nitrite, each containing 0.3 gm. in 10 cc. of water (3 per cent).

Note: Physicians can obtain ampules of sodium nitrite and sodium thiosulfate solutions from Dr. K. K. Chen, Indianapolis, Indiana.

3. Two ampules of sodium thiosulfate, each containing 25 gm. in 50 cc. water (50 per cent).

4. Two 10 cc. sterile syringes.
Two 50 cc. sterile syringes.
Two sterile intravenous needles.
One tourniquet.

Method of Use—

Have patient inhale contents of amyl nitrite pearl.

Inject slowly 10 cc. of sodium nitrite into cubital vein, followed by slow injection of 50 cc. sodium thiosulfate. The same intravenous needle can be left in place for the latter.

Watch patient continuously for 24 to 48 hours. If there is any return of symptoms during this period, immediately repeat the above treatment.

Treatment of Poisoning by Absorption Through the Skin

First-Aid—

1. Remove clothing immediately, particularly if damp from perspiration or other causes, in order to prevent further absorption.
2. Have patient inhale contents of one amyl nitrite pearl.
3. Have the patient lie down in fresh, gas-free or dust-free air and breathe deeply until all symptoms have subsided.
4. If relief is not produced in this way, give oxygen and notify a physician.
5. If breathing has ceased, begin artificial respiration at once, using the Prone Pressure method. Stop this as soon as patient begins to breathe voluntarily.

Antidotes for Poisonings from Swallowing Sodium Cyanide or Cyanide Solutions

Always have on hand a liter (1 quart) of a 1 per cent solution of sodium thiosulfate and a carton of amyl nitrite pearls.

Directions for First-Aid Treatment—

1. Immediately have a physician called.
2. Have the patient inhale the contents of one amyl nitrite pearl.
3. If patient is conscious, cause vomiting by giving soap water or mustard water.
4. Give 500 cc. (1 pint) of the sodium thiosulfate solution by mouth. This can be used by a physician as a gastric lavage or washing out of the stomach, or by producing vomiting as above.
5. Have patient inhale oxygen, or if not available, remove to fresh air, and if necessary give artificial respiration until physician arrives.

In conclusion, let me state that we have yet much to learn with regard to the hazards that may be encountered in fumigation work. In the short space of time at my disposal, it has been impossible to go into detail in any one of the hazards which I have mentioned. No mention has been made of those factors which may give rise to physical injury and certainly not all of the hazards which may be present, due to the use of the gas, have been described. If this discussion will lead to more thought and greater observance of all precautions during the conduct of a fumigation, I feel that much has been accomplished.

Salesmanship

A very despondent man was about to jump off a bridge into the river below when a passerby grabbed him by the arm and pulled him back. "Come, my good man," said the passing Samaritan, "Let's take a walk and talk this thing over." So back and forth across the bridge they walked—and talked. When they had shuttled back and forth the third time, they both jumped in the river.

National Association of Insecticide and Disinfectant Manufacturers Hold 25th Annual Meeting December 5-6

IT IS expected that one of the largest attendances ever will be present at the 25th Annual Meeting of the National Association of Insecticide and Disinfectant Manufacturers being held at the Biltmore Hotel, New York City, December 5th and 6th.

The program recently announced will include the following:

MONDAY, DECEMBER FIFTH—MORNING SESSION
J. L. Brenn, Presiding

9:00 A.M.—REGISTRATION
Meeting called to order.
Announcements.
"Tradition"—Annual Address of the President—J. L. Brenn, Huntington Laboratories, Inc.
Appointment of Committees.
Report of Treasurer—John Powell, John Powell & Co., Inc.
Report of Executive Office Committee—Ira P. MacNair, MacNair-Dorland Co., Inc.
Report of Membership Committee—Russell H. Young, Davies-Young Soap Co.
Roll Call.
Introduction of Guests.
Selection of Nominating Committee.
"Legislative Outlook for 1939"—C. L. Fardwell, McCormick & Co., Inc.
Ohio State University NAIDM Fellowship Progress Report—Dr. F. L. Campbell, Associate Professor Entomology, Ohio State University, Columbus, Ohio.
Report of Entertainment Committee—L. J. LaCava, Continental Can Co., New York.

LUNCHEON

MONDAY, DECEMBER FIFTH—AFTERNOON SESSION
W. J. Zick, Presiding

2:00 P. M.—Meeting called to order.
Announcements.
Report of Insecticide Literature and Patents Committee—John N. Curlett, McCormick & Co., Inc.
"Let's Sell the Public What It Needs"—H. A. Thomas, Shell Petroleum Corp., Chairman, Insecticide Marketing Committee.
"Office Building Sanitation"—Frank S. Cooper, Jr., Superintendent, International Building, Rockefeller Center, New York.
Report of Sanitary Specialists Committee—Melvin Fuld, Fuld Bros.
"Determination of Rotenone and Pyrethrins in Insecticides"—J. J. T. Graham, Senior Chemist, U. S. Department of Agriculture, Food and Drug Administration, Washington, D. C.
Adjournment.

SPECIAL

4:30 P. M.—Meeting for all those interested in standardizing Rotenone Analysis and Testing Methods. Dr. Alfred Weed, Chairman Insecticide Scientific Committee, presiding.

TUESDAY, DECEMBER SIXTH—MORNING SESSION
J. L. Brenn, Presiding

10:00 A. M.—Meeting called to order.
Announcements.
"A Method for Bacteriologic Testing of Chemical Solutions for the 'Cold Sterilization' of Surgical Instruments"—Dr. Geo. F. Reddish, Lambert Pharmacal Co.
"Methods of Testing"—Dr. Emil G. Klarmann, Lehn & Fink Products Corp.; Chairman, Disinfectants and Antiseptics Literature and Patents Committee.
"Scientific Phase of Disinfectant Specifications"—Jack Varley, Baird & McGuire, Inc., St. Louis.
"Outlook in Disinfectants Marketing"—H. W. Hamilton, White Tar Co. of New Jersey; Chairman, Disinfectants and Antiseptic Marketing Committee.
"What Shall We Do With Specifications?"—Gordon Baird, Baird & McGuire, Holbrook.

(Continued on page 18)

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THIS improved insecticidal agent has the same desirable characteristics that made Lethane 384 the outstanding concentrate. In addition, its use will entail no problem of odor or irritation.

Our improved product costs no more than Lethane 384. Therefore, higher concentrations can be used and better control obtained at lower cost than is possible with most other insecticidal concentrates.

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"Insecticides and Disinfectants in the Fur-Bearing Animal Industry"—Dr. Ronald G. Law, Chief Sanitary Officer, Canadian National Railways, Montreal, Canada.
"Home Made Fly Sprays"—Dr. R. C. Roark, in charge, Insecticide Investigations, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C.
Report of Insecticide Scientific Committee—Dr. Alfred Weed, John Powell & Co., Inc.

Afternoon Session

2:00 P. M.—Meeting called to order.
"Products Liability Insurance"—Clarence E. Cooper, Clarence E. Cooper Co., Inc., New York.
Report of Resolutions Committee.
"Some Practical Aspects of Fair Trade Marketing"—Q. Forrest Walker, Economist, R. H. Macy & Co., New York.
Election of Officers and Board of Governors.
6:00 P. M.—Cocktail Party.
7:00 P. M.—Informal Beefsteak Dinner and Floor Show—Main Ballroom, 19th Floor Hotel Biltmore.

W. J. ZICK, Chairman, Program Com.

Season's Greetings

To the Members, Their Families and Friends of the National Pest Control Association

This season, more than almost any other, our fervent wish is for "Peace on earth; goodwill towards men."

The past year has taught a dreadful lesson . . . yet one that the civilized world has not learned in vain. For, as we think in retrospect of the last twelve months, we realize—more than ever—the importance of cherishing a bond of good-fellowship among ourselves.

The happiness we can bring to others in our daily contacts is returned a thousandfold in the warmth of a friendly handclasp, the sincerity of a brotherly greeting. The fine associations one forms through the years are priceless possessions.

Our work together has been truly distinguished by harmonious accord with one another. Our earnest wish is for the continued success of the Association. Through individual effort, let us strive in the coming year to maintain what we have achieved in the past.

On behalf of your officers, I'd like to wish you all—not only a Merry Christmas and a joyful, prosperous New Year—but a continuation of the peace and goodwill we have long enjoyed.

H. G. IRVING SAMETH,
President.

CHLORPICRIN

By **CONRAD C. JOHNSON**, *Manager Insecticide Division*
Innis, Speiden & Company

EDITOR'S NOTE: *We fully appreciate that this artcle is written by one enthusiastic about Chlorpicrin. In keeping with our policy,* PESTS *is continuing to present articles of partisan nature so as to provoke greater interest in the field of pests and pest control. In a way this article might well have carried a caption "Fumigation Profits — From Off the Beaten Path." Our pest control field is constantly widening so as to bring larger pest control operations for the P.C.O.'s.*

FUMIGATORS are today finding their professional services in demand for many other types of work than that of exterminating the time-honored bedbug. Many fumigators report that these other jobs are increasing and that they show a better profit margin.

Very often these other types of work make demands not easily met with the usual gases. The purpose of this article is to show how Chlorpicrin, the fumigant with the inseparable tear gas warning, may be often used to meet these demands and thus help increase fumigation profits. There will also be mentioned a vast new field for Chlorpicrin, a field which should shortly open up for the progressive fumigator.

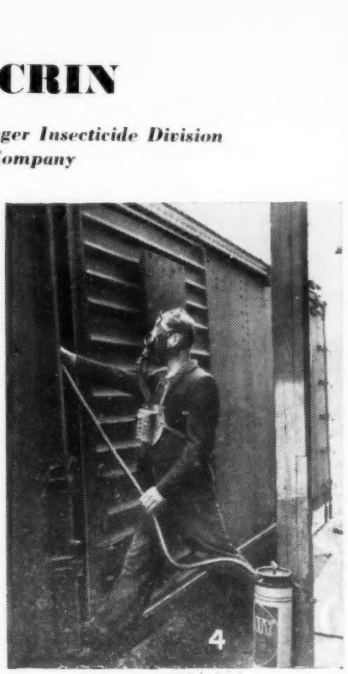
Mopping Up the Moth

Aside from bedbugs, one of the commonest of the fumigator's problems is the clothes moth. Here penetration is of utmost importance, and because of its facility for getting down into the remote retreats, Chlorpicrin is made to order for this job. It is a heavy gas, and penetrates so thoroughly that re-does' are rarely called for. With Chlorpicrin it is unnecessary to remove rugs from floors or to unpack trunks to get the kill. Furthermore, this gas has no harmful effect on delicate textiles or colors, or on expensive furs. Only 9 or 10 fluid ounces are ordinarily required for each one thousand cubic feet, and the premises are left under gas for 20 to 24 hours. Successful moth jobs yield good profits.

Post Mortems for Powderpost Beetle

The insect about which we are hearing more and more is the powder-post beetle. Many fumigators regard this pest as difficult to reach, yet Chlorpicrin has given satisfactory results. To fumigate furniture, such as hickory, it is necessary only to place the pieces in a vault or other tight space and to release up to 1½ fluid ounces per 100 cubic feet. In fumigating buildings 10 fluid ounces per thousand cubic feet is ordinarily used, with a little extra concentration where the infestation is most severe. Where infested beams are exposed, it is considered good practice to tack burlap sacks around them and to spray liquid Chlorpicrin against these sacks.

Lumber companies are becoming conscious of infestation in their product, such as powder-post beetle and termites. A real selling point in their very competitive market is secured by guaranteeing freedom from insect life. The lumber is vault-fumigated with Chlorpicrin at an insignificant cost per thousand board feet, and the penetrating ability of this gas enables it to reach insect life wherever it may exist in the lumber.



"Hand compressor sprayer said to 'chlorpicrinate' box cars efficiently in approximately five minutes."

Cracking Down on Box Car Bugs

"What," we have been asked, "about cold weather work as in freight cars?" You know of course that the efficiency of a fumigant decreases with lowering temperature, and Chlorpicrin is no exception. However, with the proper precautions observed, it is successfully used every winter in fumigating freight cars at temperatures down to 30° F. and even lower. Two precautions are necessary. First, a larger amount must be used, and second, the liquid **must** be finely broken up by spraying so that it will gasify quickly. In tight steels cars 10 or 12 pounds are used to do a good job on sacked material like flour or feed at fall temperatures.

De-buging the Flour Mill

In flour mill fumigation we think we are safe in stating that, so far, Chlorpicrin has no equal among the commercial gases. It is flexible enough to be spotted heavily where infestation is most severe, and its remarkable degree of penetration enables it to reach insects and their eggs anywhere in the mill.

The backbone of the mill work is treatment of the machinery, which harbors 95% of the infestation in 5% of the mill space. Even in mill buildings of very loose construction, lasting results are secured by this plan of treating machinery, and the preparation work takes usually not over half an hour. For moth, one general machinery treatment a year is the usual practice; and for weevil, up to two per year. The mill program also includes grain treatment, vaults and rodent control.

De-corporating Rodent Bros. & Co.

Not until the fumigator and his client have actually seen the results of a rodent fumigation with Chlorpicrin will they realize what a "beautiful" and lasting job can be done. By "beautiful" we mean that the carcasses are out on the floor where they can be seen and easily gathered.

The tear gas routs the rodents out of their nests and other hiding places. A light

sprinkling in burrows will make and keep them too uncomfortable for rodent habitation for many months—and this means real customer satisfaction.

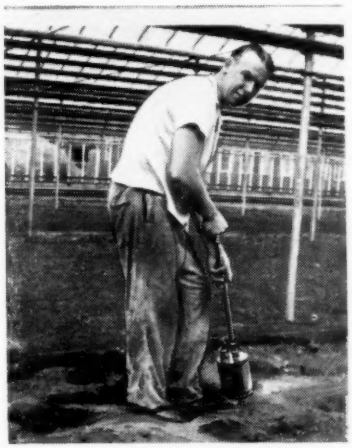
In rat contract service work, the usual equipment is a pint bottle for making light applications into holes and burrows—simple, inexpensive, labor saving.

When it comes to cleaning rodents out of refuse dumps, Chlorpicrin is meritorious. Small amounts are thrown down the burrows or into specially prepared holes, and the tear gas makes the entire dump untenable to the rodent population. Most of the rats acquire a lethal dose from the Chlorpicrin, but with respect to the others, special precautions must be taken because of being in the open air.

Fungus and Athletes Feet

One little known property of Chlorpicrin is it fungicidal action. Recent research work has demonstrated that 6 fluid ounces per thousand cubic feet kills the vegetative stages of probably all fungi—and tests have already been made on a great many. At about an 11 fluid ounce rate, it kills the sclerotia forms. This property has recently been put to practical service in the south where, at the close of the winter season, homes are treated with Chlorpicrin, and when the houses are reopened in the fall, the usual mustiness isn't found.

Some firms have gone so far as to make a mixture of Chlorpicrin with vaseline for the treatment of athlete's foot—a fungus disease. The results are said to be eminently successful.



"A soil applicator for Chlorpicrin said to be capable of treating 2,000 square feet per hour."

A Brand New Field—Soil Treatment

Speaking of fungicidal properties brings us to that new field mentioned earlier as opening up for Chlorpicrin. We refer to soil treatment work—greenhouses, market gardens, golf courses, country estates and homes. In this field Chlorpicrin is getting results hitherto considered impossible. It is, in fact, doing more than any other single chemical. Chlorpicrin kills soil insects, pathogenic soil fungi, nematodes, weed seeds and noxious weeds. Under proper conditions all of this can be accomplished with a single application of a few cubic centimeters per square foot.

To illustrate the result of controlling pathogenic soil fungi: yields on treated soil increased from 10% to more than 200% according to 1937 reports of an eastern experiment station. Tests also indicate that the soil bacteria and the nitrate/nitrogen level are not disturbed, nor is the soil put out of condition in any way. As the result of research work a great deal of information is already available, and demonstrations are convincing commercial prospects.

The following will serve as examples of what Chlorpicrin has controlled: chinch bugs, Japanese beetle, damping off, phomopsis, fusaria diseases, rhizoctonia, nut grass.

As Chlorpicrin becomes available for commercial soil work in the near future, the progressive fumigator will have opportunity to broaden his business and build up his profits in many of these fields, such as the crab grass problem and "sick" garden soil for country estates and private homes, where contacts have already been established by him. Whether the development of this new and logical market comes to the fumigator who already knows the handling of gases, or goes to the landscape gardener will be determined by the fumigator's interest and the degree of his activity in taking advantage of the opportunity.

Character never comes by accident.

Remember you get the respect you earn, no more."

The world is so full of a number of things, I'm sure we should all be as happy as kings!

Monarch Powder Sprays

Offering Our New Household Powder Sprayer No. 43

Filling capacity 4 ounces

Short taper tip of brass nickel plated.

Large filling space with screen to break up powder.

A live and inexpensive number especially adapted to offer with powders to Janitorial and Household trade.

Write for Price List and Discount Sheet.

ESTABLISHED OVER 50 YEARS

THE VANT WOUD RUBBER CO.

JERSEY CITY, - - - - NEW JERSEY

Swift Murder for Rats

THALLIUM SULFATE

Odorless - Tasteless - Economical

WRITE FOR LITERATURE ON USES

FOOTE MINERAL CO.

1604 Summer Street Philadelphia, Pa.

HEADQUARTERS

FOR

WIZO RAT PASTE

FOR CONVENIENT AND RAPID RESULTS

Kills rats and mice. Contains a deadly poison. Spread thinly over bread, cut into squares and place wherever rodents appear. Rats leave premises and die outside.

25 lb. cans @ 45c per lb.
10 lb. cans @ 50c per lb.
5 lb. cans @ 55c per lb.
1 lb. cans @ $6.00 per dozen
½ lb. cans @ $3.60 per dozen
F. O. B. New York, N. Y.

Write for our catalog describing our complete line of exterminating and sanitary chemicals.

ELKAY PRODUCTS CORP.

323-327 West 16th Street New York, N. Y.

LOCAL ORGANIZATION NEWS

Associated Exterminators and Fumigators of New York

Over fifty attended the regular monthly meeting of the Associated Exterminators and Fumigators of New York held at their headquarters at 7 East 44th St., New York City, Tuesday, November 22nd. President William O. Buettner presided and Executive Secretary William J. Parker submitted a brief summary report of his first year as paid secretary of the Association. Routine business was rapidly disposed of so that speakers and other reports might be submitted.

The Association gave vigorous approval in welcoming H. G. Irving Sameth recently elected as president of the National Pest Control Association. Mr. Sameth spoke of the Omaha convention and plans for the Seventh Annual Convention of the National Pest Control Association to be held in New York City in October, 1939. Enthusiasm was equally as great at the announcement of William J. Schrimplin as local chairman of the Seventh Annual Convention. Mr. Schrimplin described in more detail more of the plans and promised plenty work for all so that the convention would beat all previous records.

Walter S. McCloud of Chicago, Illinois, brought greetings in his capacity as Regional Vice-President of the National Association emphasizing the strides that had been made by the National Association and told of the recent successful meeting at Baltimore on the occasion of the invitation extended by the Eastern Branch of the American Association of Economic Entomologists. Over fifty pest control operators from the Atlantic coast states attended the meeting of which twenty-one were from New York City.

The guest speaker of the evening was Prof. J. J. Davis of Purdue University, who explained the relationship between entomologists and commercial pest control operators. The rapidly growing co-operation between these two groups has evidenced itself in many ways, such as meetings with entomologists, greater correspondence and personal interviews, pest control operators conferences such as were held at Purdue for two years, at Leland Stanford in California the early part of this year and a continuance of these conferences early in 1939. The benefit of much research, said Dr. Davis, was available for the commercial pest control operator, and entomologists are anxious to be of service to the industry. This was especially noticed at the recent Omaha convention when some twenty-four entomologists and governmental officials actively participated. Dr. Davis placed considerable emphasis on the need of pest control operators attending the annual conventions which served as a common meeting ground to discuss problems not only of pest control but of the business side of the industry. Assurances were given by Dr. Davis that he would assist in every way possible to make the 1939 convention the most successful yet and consented to assume the job of Dean of the Clinics at the Seventh Annual Convention.

"Some people learn from their experiences, but many people never recover from them."

California Pest Control Association, Inc.

The October issue of the California Pest Control Monthly tells of the progress being made by the California Pest Control Association. Editor George A. Rader is to be complimented on this fine bulletin that keeps the California constituency well informed.

Wayne K. Davis, general chairman of the state convention, is working on the final plans for the Fifth Annual Convention to be held Thursday and Friday, February 23 and 24, 1939. The following day (Saturday) will be given over to a visit to Treasure Island where the Golden Gate International Exposition will be in full swing. Lake Merritt Hotel, Oakland. Calif., has been chosen for the convention headquarters.

The Second Annual Pacific Coast Pest Control Operators Conference will be held at the University of California at Berkeley on February 20, 21 and 22, 1939. Professor William B. Herms, Dean of the Conference, reports that plans are now under way to conduct this and all future conferences on a systematic and progressive curriculum basis, that is to say, this coming conference and all future conferences will be built up from year to year wherein there will be no repeat of the previous years' material as formally presented. It will be somewhat like starting in with the freshman year and progressing until the senior year has been completed. From that time on, the conferences will be of the nature of post graduate work. However, at each conference emphasis is to be placed on the simplicity of presentation—no matter how complex the subject matter may be. All members of the industry west of the Rocky Mountains, whether they are or are not members of the association, may attend the conference sessions upon payment of the usual registration fee.

Elmer A. Roberts as chairman of the committee on legislation emphasizes that there are no secrets with regard to what is desired by way of amendments of the California Structural Pest Control Act. The suggestions will be compiled and submitted to the industry.

San Diego District

Lee Christensen reports that the members of the San Diego District got together and worked up an exhibit at the County Fair at Del Mar. The operators took turns at taking charge of the booth. Those viewing the exhibit showed a great deal of interest. This is something that might well be tried by way of co-operative enterprise by local groups.

District No. 6

Since last reporting District No. 6 has had two genuinely alive meetings at which the boys learned a few more things to tuck into their "think-caps." The first meeting was held at the home of George Rader at which twenty-three members turned out. Professor Herms and three guests were also present. Stennet S. Heaton gave an extremely interesting illustrated lecture on the subject of "General Pests." The pictures shown were pronounced by Prof. Herms as being exceptionally good, and the discussion was unusually interesting. The second meeting was held at the home of Mr. Heaton and was known as "Manufacturers' Night." Representatives from several firms supplying materials to the pest control industry were on hand to tell the local operators about what they have to offer to assist in the control of insect pests in general.

District No. 7

The monthly meeting of District No. 7 of the California Pest Control Association was held at Ada's in Burlingame, Calif., on November 14th.

Much interest was centered in the report that H. V. Montgomery brought back from the Sixth Annual Convention of the National Pest Control Association held at Omaha, Nebraska.

A membership drive was also discussed and several names suggested.

Ernie Mills, president, presided and among those present were A. T. Parsons, George W. Peterson, Robert E. Hackley, Wayne K. Davis and V. H. Montgomery.

Greater Pittsburgh Pest Control Association

At a recent meeting of the Pittsburgh Pest Control Association Louis Gatto was elected to the presidency and Joseph Laughlin to secretaryship.

This group is actively engaged in a co-operative educational campaign with the Pittsburgh Health Department in fighting rats.

National Association Notices

Members are urged to call on each other, especially when traveling about the country. A permanent office is not required, but for those firms visiting New York City, it is urged that the secretary be called at either South 8-4120 or South 8-4121 and appointment will be arranged.

Membership Service Letters: The demand for these Service Letters is becoming greater all the time in view of the valuable information contained therein. The next few letters will of necessity cover some of the highlights of the Convention and in view of the fact that it is too early to give a detailed outline, it can only be suggested that this Notice column be watched carefully in the December issue of Pests so that one may make certain that he has received all copies. The column will at all times carry the information with regard to the membership service letters. Taking up where we left off in the October issue of Pests:

Communication No. 130: Usual Membership Service Letter and detailed announcement about the Symposium on Control of Household Insects held at Baltimore, Md., November 17th. Communication No. 130 was mailed November 7th.

Communication No. 131: Usual Membership Service Letter mailed November 9th with special emphasis on "Group Advertising."

Future Service Letters: Material is rapidly being assembled for three or four Membership Service Letters during December but detailed announcement will appear in the January issue of Pests.

Applications for Membership: The Association does not make a practice of having

a membership drive and this primarily because we feel that the Association sells itself in terms of activities and other features. Pest Control Firms are cordially invited to request the application form for membership.

National Seal: It is gratifying to notice the general use of the seal on letterheads, advertising and classified telephone directory advertising. If you have not ordered your cut, do so immediately. Cuts are provided in two sizes, ½x¾" and ¾"x1". The charge is $1.00 per cut or if two or more are ordered at the same time, $1.00 for the first cut and 50c additional for the extra cuts. No orders filled without check or money order accompanying.

Army of Ants Drink Up 80 Barrels of Beer

Darwin, Australia — The greatest beer drinking orgy in the history of Australia was staged here by thousands and thousands of white ants who invaded the cellar of a saloon where 80 barrels of beer were stored.

Every barrel was riddled by the ants and not a drop of drinkable beer was left, and apparently with the ants none the worse for their night out. The damage to the saloon keeper, both in the wreckage of the barrels and the consumption of the beer was $1200. — The Dispatch-Journal, Dallas, Texas, No. 10, 1938.

WHAT'S NEW IN PEST CONTROL-PERSONALS

Conventions certainly make for excuses for long trips. The Jess Millers' finally arrived home November 14th after traveling some 4400 miles from Omaha, doing a "Corrigan" by touching the east coast before heading west.

Harold E. Jennings of Chicago, Ill., had a busy trip east the early part of November. Six a. m. found Harold and Bill Buettner still going strong on industry problems.

The profound sympathy of the industry is extended to Merwyn Horwitz and his family on the loss of his mother, November 9th. Mr. Horwitz is the proprietor of the Excelsior Exterminating Company of New York City.

The Omaha convention brings more and more favorable comment. Boiled down the comments reflect a sentiment of "Best Yet"; greater sustained interest than ever; and the following summary about our speakers and research leaders, "the quality of papers and addresses was such that not a single one seemed 'dry' but gave us what we were looking for."

George R. Elliott of the Ransford Insecticide Company of Worcester, Mass., reports that the Omaha trip netted a total of about 150 match covers. George's son, Dick, is making a collection of these match box covers.

Writes Mrs. Franklin D. Roosevelt in her column "My Day" in regard to her visit in Omaha, "Before I went to my lecture in the evening I was invited to glance at the exhibition put on by the National Pest Control Association. Having read a little while ago about the devastation which a pest of grasshoppers had created in some of our western counties, I felt that this group was tackling some really important problems." Mrs. Roosevelt was presented with a handsome bouquet of flowers by Miss Veronica Hahne while visiting the exhibition.

There must be SOMETHING about the annual conventions of the National Pest Control Association. Hardly a day goes by that someone does not comment about the worthwhileness of the program. Just a few observations: Hy Arendall of Innis, Speiden & Co., making his first visit at one of the conventions was impressed with the manner in which those attending made it their business to attend all sessions promptly showing keen interest; Senne of Sennewald has not missed a convention and continues to feel that Harry Hammond of Milwaukee looked different and rumor has it that this is the first year that Harry was not found wearing a light gray suit; The convention was "tops"; J. N. Seidman of Detroit was found trying to assist with a "piggy-back" ride during the parade as one of the ladies began complaining about her "tootsies"; M. F. Canle of the American

(Continued on page 22)

A NON-POISONOUS RAT KILLER

15c PER POUND IN ONE-POUND TIN CANS

For Safety, Effectiveness and Economy
—USE

SUR-RID RAT KILL

Try It—It Saves Time and Money

SUR-RID Rat Killer is tested in our own laboratory on both wild and tame rats and we GUARANTEE the Killing Power.

SUR-RID Rat Killer contains meat, cereals, vegetables and just the right amount of a tested killing agent. It is especially appetizing to rats and mice as there is only an odor of fresh meat and vegetables and there is no raw odor of chemicals; four distinct lures, MEAT, FISH and CEREAL and CANTALOUPE, packed either assorted or of one kind to a case, which contain three dozen one-pound cans.

Due to the increase in the sale of this Rat Killer, we are reducing the price as follows:

	Per Dozen
Three Dozen Lots, labeled	$2.00
Gross Lots, labeled	1.90
Gross Lots, no label	1.80
The half-pound size, packed five dozen to a case	1.25

Freight Prepaid on Gross Lots. Less Than Gross Lots F. O. B. St. Louis, Mo.

SUR-RID PRODUCTS COMPANY
Manufacturers
(FORMERLY REAL EXTERMININATING PRODUCTS CO.)
455 PAUL BROWN BLDG., ST. LOUIS, MO.

FACTS

About Per-Mo Permanent Mothproof Liquid

Per-Mo is easily applied to rugs, carpets, over-stuffed furniture, drapes, blankets, wearing apparel and other woolen articles. Chemists' tests prove that Per-Mo becomes an integral part of the fabric, the same as a dye. Its efficacy is not impaired by dry-cleaning, washing, exposure or use. Even years after the application of Per-Mo moths cannot injure any fabric so treated.

WHAT SOME USERS OF PER-MO SAY

We are proud to say that we have used quite a bit of the Per-Mo mothproof material, and so far, have found it to be very satisfactory.—Pest-Control Operator.

Since using Per-Mo in this building five years ago we have never seen any sign of moths. We cannot recommend your product too highly.—Apartment Manager.

Since having my entire house treated with Per-Mo I've had no fear of moths whatsoever, and it has been a joy and help. I can most sincerely recommend Per-Mo.—Housewife.

Per-Mo Mothprooof is a colorless and odorless liquid, that is applied to any woolen fabric with a spray-gun, either electrically or hand powered. Write for full particulars.

Salesmen and Jobbers Write for Exclusive Territory.

PER-MO MOTHPROOF CO.
3729 Virginia., Dept. M. Kansas City, Mo.

Cyanamid Co., had a little trouble with the car but Harvey Klein of Milwaukee proved himself a good pinch hitter.

Forty-one of their friends and relatives attended an informal reception given Mr. and Mrs. William J. Shrimplin on the occasion of their 47th wedding anniversary on November 23. "Bill" Shrimplin is in charge of the Rose Exterminator Co., of New York City. Judging by the "pep" of "Bill" at the reception we can be assured of splendid arrangements for the Seventh Annual Convention of the National Pest Control Association to be held in New York City October 23-24-25, 1939, since "Bill" is local chairman of the New York City Committee.

His many friends in the pest control industry will be pleased to learn that Ernest R. Barber of New Orleans, La., is convalescing after a serious automobile accident on the return trip from the Omaha convention. About 100 miles out of Jackson, Miss., Mr. Barber's car turned over three times. The serious injury to his left leg and infection that followed are still under the doctor's care.

C. Norman Dold of Chicago, Ill., enjoyed a much needed rest and vacation in the southland. Norman thoroughly enjoyed his birthday celebration with his mother on November 24th at Orlando, Florida.

After attending the meeting of the Eastern Branch of the American Association of Economic Entomologists at Baltimore, Md., H. G. Irving Sameth, president; Walter S. McCloud, regional vice-president, and William O. Buettner, secretary, of the National Pest Control Association went to Washington, D. C., to discuss matters of interest to the pest control industry with various governmental official. They praise the genuine desire on the part of the officials to co-operate with our industry. Calvert Cissel joined the committee on two of the calls that were made.

After a few days in New York City Walter S. McCloud headed back for Chicago, Ill. His visit and participation at the New York City meeting of Pest Control Operators almost seemed like "old home week" in that Walter's friends were pleased to see and hear him again as he told of progress being made.

Prof. J. J. Davis of Purdue University was seen crawling under houses in Mt. Vernon and Bronxville, New York, so as to have some first hand information about termite control operations on the east coast. "Doc" Davis now has the answer to "When is a tunnel a tunnel?"

We have heard of guests being invited to spend an evening but it takes frugal New Englanders to interpret this as meaning that such invitation also includes dinner. The four members of the Eldredge family were about to have dinner when two of the guests arrived earlier than had been anticipated. Someone had better take up with Charlie and Louise Houghton how Emily Post dictates a situation like this should be met. Right you are, Charlie, it was up to the Eldredges to provide two more places at the dinner table and the genial hosts Bartlett and Eunice Eldredge joined in the laugh on and with them. Just for the record: The date was November 17.

Bill, the indomitable, as everyone knows, is an inveterate cigar smoker. While flying from Newark with Bill recently to attend the N. P. C. A. Convention, Walter McCloud suffered a considerable attack of "mal de air." Well, to get on with our story, Walter relates the moment Bill boarded the plane he lit up a nice fat cigar and serenely puffed away, unbothered by man nor beast. By the time they got to Omaha, Bill had a bit of a butt of the self same cigar left in his mouth. So at the banquet he was presented with a cigar a foot long —and it was dubbed—you guessed it—a coast to coast cigar.

Elmer A. Roberts of Burlingame, Calif., is enjoying his six week's trip. The latter part of November found him in New York City and all is well.

An Injector for Forcing Liquids into the Soil

In Mimeograph ET-127 (August, 1938, of the U. S. Bureou of Entomology and Plant Quarantine), Charles B. Eaton has described an injector which has been thoroughly tested under laboratory and field conditions and has been found to be accurate, efficient and practical for regulating the amount of liquid applied in soil injection work. The equipment should prove of much value to those studying soil insecticides and fungicides.

Devil's Shoestring: Its Insecticidal Possibilities

The value of rotenone as an insecticide has led to investigations of plants, other than cube and derris, which might be useful as sources of this useful insecticide. Technical bulletin 595 of the U. S. Department of Agriculture entitled "Studies on the Possibilities of Devil's Shoestring **(Tephrosia virginiana)** and Other Native Species of Tephrosia as Commercial Sources of Insecticides" reports on investigations to date.

The studies indicate that "(1) plants from all but a few restricted districts are lacking in insectidal value; (2) toxic plants are found almost exclusively in the region extending south and west of central Georgia, in northeast Florida, and in northeast Texas; and (3) the Durham color test, which is easily made, gives a reasonable reliable indication of the plants toxicity to flies and is, therefore, an excellent means of determining the value of plants rapidly in the field."

Timbo Too

The recent decision favoring the Derris patent in the use of cube as an insecticide, has stimulated interest in other plants which carry the insecticide rotenone. An advertising letter of recent date from S. B. Penick and Company comments on the relative value of timbo root. Quoting from Dr. Roark they include the following pertinent statement: "Timbo is a Brazilian word that is applied to many species of plants belonging to different families, but all of which have fish-poisoning properties. Cube is a Peruvian word that has been applied to different fish-poisoning plants, especially **Lonchocarpus utilis** and **Tephrosia toxicaria.** Barbasco is the general word for fish-poisoning plants in Spanish-speaking countries. There has been a tendency recently by the trade to use the terms 'timbo,' 'cube,' and 'barbasco' as synonyms."

Termites

Their chief function in the world is to eliminate dead wood in the forests, to make way for new growth, and in attacking the wood in a building, they are doing just what Nature intended them to do. We should not, therefore, expect their complete eradication for they have been here since prehistoric times. They are here for a purpose; they are here to stay. The best that we can hope for is to keep out of their destructive reach the lumber that we do not intend them to have.

14th Annual Edition Chemical Industries Buyer's Guide-book Number

Users of the popular "Chemical Guide-book" number of Chemical Industries will be agreeably surprised to note the addition of three new valuable and highly informative sections in the 1938 edition just published. The buying section on chemicals has been supplemented by buying sections on natural raw materials and industrial chemical specialties and also by a dictionary of nearly 20,000 brand and trade names with an identification of what each is and the maker. Thus for the first time buyers are provided with satisfactory information as to sources of supply of all types of chemical products.

Buyers of industrial chemical specialties used in a wide range of industries will find suppliers of every specialty from abrasives to zeolites. Plant and building maintenance items are fully covered. The technician and the buyer alike and all those in any way interested in the use of chemicals will find this "Guide" an indispensable tool.

As in the past 13 editions, the latest provides under each of the 2,846 raw materials, chemical and chemical specialty headings, complete technical data, including formula, molecular weight, other physical and chemical properties, uses, containers, etc., so that the book is really two books in one, a buyer's guide and a chemical dictionary.

The Company Directory Section is a complete and up-to-date address book of manufacturers, importers, and local distributors arranged geographically by states and cities. The buying sections are completely cross-indexed and all the commercial and technical synonyms are listed in the index. The annual high-low quotations for the past five years on over eleven hundred commercially important chemicals, raw materials, etc., are given. Also a very complete list of associations and societies together with the officers' names and addresses. The 14th edition, containing 624 pages, is almost twice as large as the previous one and three times as large as the 1934 edition. Write for particulars to Chemical Industries, 149 Temple St., New Haven, Conn.

Streamlined Fleas

Dr. G. I. Watson of Wimbledon, England, looked at fleas through a magnifying glass and saw that their bodies were streamlined. But in the wrong way. That is, the heads and not the sterns were tapered. The fact that feathered darts always point first even if hurled tail first flashed on him. Does the flea jump head first, twist around in flight and land tail first? He examined fleas as they landed. Sure enough, he reports in a communication to the British scientific weekly Nature, they always land tail first.

This skeptical department wonders what the speed of a flea's fight-like jump is. If under fifty or sixty miles an hour there would be no sense in a tail-first leap. Dr. Watson should continue his experiments.

The measurements that Dr. Langmuir has made indicate that insects are very much slower than the naturalists thought they were. Probably fleas are not as quick on the jump as we believe. Maybe jumping fleas always land tail first for reasons that have nothing to do with streamlining. This holds good for fish too, which though streamlined, do not swim very fast.

WRITE FOR THESE BOOKLETS

The latest helpful informative service literature will be sent to you without cost or obligation.

Please note, however, that you must request each booklet on a separate letterhead, though they may all be mailed in the one envelope to 514 East 14th St., Kansas City, Mo.

INSECTICIDE GUIDE

Twenty-eight page pamphlet discussing facts you should know about pyrethrum flowers; dilution table for plant sprays; dilution chart pyrethrum soap; how to mix effective baits; derris root, etc. Of special interest to jobbers and exterminators.

WRITE FOR YOUR COPY BY ADDRESSING HOPKINS c/o PESTS.

HOW TO KILL RODENTS

Pamphlet discussing gas ball rodent destroyer; tubular rodent destroyer; new patent traps; explosive devices; squirrels and bubonic plague; ground squirrel control; black widows, tarantulas, wasps, ants, etc.

FREE COPY MAY BE HAD BY ADDRESSING HITT c/o PESTS.

SPRAYERS

Seventy-two page colorful catalog; illustrated; showing sprayers for everybody everywhere.

FREE COPY MAY BE HAD BY ADDRESSING HUDSON c/o PESTS.

POWER SPRAYERS

Folder describing sprayers for termite control work.

COPY MAY BE HAD BY ADDRESSING HARDIE c/o PEST.

PYROCIDE 20 DEODORIZED CLARIFIED

Is the subject of an informative and instructive pamphlet. Illustrated. Lists some pertinent facts about Pyrethrum; chemical evaluation of pyrethrum; biological evaluation of Pyrethrum; commercial grades of Pyrethrum; effect of storage, light, and heat on Pyrethrum products. Formulae for household insecticides, livestock sprays, mosquito larvicides; horticultural sprays.

FREE COPY OF PAMPHLET MAILED FREE TO INTERESTED PEST CONTROL OPERATORS and INSECTICIDE MANUFACTURERS. Write McLaughlin, c/o Pests.

INSECTICIDE SOLVENT:

This is a descriptive folder covering high lights on volatility, refining process, specifications, killing power on Insecti-Sol, an insecticide spray and stock spray solvent and other qualities of interest to manufacturers of fly sprays. Insecti-Sol claims unusual advantages for use by pest control operators in the manufacture of their bed bug preparations.

DESCRIPTIVE LITERATURE WILL BE MAILED FREE TO READERS ON REQUEST. WRITE TO "PENNSYLVANIA," c/o PESTS.

Acme Protection Equipment Co., Inc., announces a new No. 5 full vision snout type canister gas mask with a number of new features. Outstanding features are full vision lenses and a light-weight canister

(Continued on page 24)

Buying Sources

If there is any product or piece of equipment you do not see advertised in PESTS and you would like more information or data on it, please write us over your letterhead or fill out the coupon below and we'll go to work. No charge or obligation, of course, for this service.

PESTS,
512 East 14th Street,
Kansas City, Mo.

Gentlemen:

Please send me further information on following products or equipment:

.....

.....

Name.....

Address.....City.....

Pest Control Operators

Centrobulb A 8-oz. Centrobulb B 14-oz.

ATTENTION

The new *Centrobulb* is here with the following improved features:

1. Shaped and balanced to lie in palm without cramping hand.
2. Bulb — Guaranteed seamproof.
3. Nozzle — Heavy, rustless metal, guaranteed not to crack even under pounding. Deep cut thread —it can't work loose.
4. Largest opening for instant filling —stay tight metal screen to prevent clogging.
5. Nozzle base permanently attached to bulb.

You'll Be Surprised At Our Low Prices.

CENTRAL RUBBER PRODUCTS
830 Broadway **New York, N. Y.**

which permits greater freedom to the wearer. The mask has an unusually wide field of usefulness.

FUMIGATION POINTERS

Service bulletin showing varied applications of the Cyanide Generator and its easy adaptability. Also discusses Fumigation Furniture En Route as a profitable field opening up for the fumigator; atmospheric and vacuum vault fumigation; mushroom house fumigation and illustrated data on a new lock seal which promotes safety.

FREE TO INTERESTED FUMIGATORS. WRITE DU PONT c/o PESTS.

SAFETY EQUIPMENT FOR P. C. O.

Free literature on all types of safety equipment, such as gas masks for fumes, respirators for dust, approved by the Bureau of Mines, hard rubber drainers, aprons and goggles, and various other types of safety equipment for protecting Pest Control Operators on all hazards.

FOR FURTHER INFORMATION WRITE WAHLERT, c/o PESTS.

AGRICULTURAL PRODUCTS

Attractively illustrated folder discussing chemistry in agriculture; jelly ant bait and directions for use on golf greens; gardens and shrubs; household. Mention is also made of an organic turf fungicide and directions for its use. Borerkil for tree boring insects; effective method of borer control and directions for use. Borerkil force gun illustrated. Use as a dog repellent; fumigant for poultry roosts. Formula for nicotine spray also given.

FREE TO INTERESTED PEST CONTROL OPERATORS AND TREE SURGEONS. WRITE LETHELIN, c/o Pests.

AROMATIC PRODUCTS

Descriptive 38-page 8¼x11 Catalog, part of its contents devoted specifically to odors for Insecticides and Disinfectants. Pest Control Operators who make their own fly sprays, users of Lethane, kerosene, perfuming oils to scent and color napthalene and paradichlorbenzene blocks and crystals should send for a copy of this catalog, No. 10.

DESCRIPTIVE LITERATURE WILL BE MAILED FREE TO READERS ON REQUEST. WRITE TO GIVAUDAN, c/o Pests.

HOUCHIN CATALOG

Contains data on Blower for powders and liquids; also information concerning Insect Powder Bellows. Should be of interest to all pest control operators.

WRITE FOR YOUR COPY BY ADDRESSING HOUCHIN, c/o Pests.

SOLVAY PRODUCTS

48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

FREE COPY MAY BE HAD BY PEST CONTROL OPERATORS. WRITE SOLVAY, c/o PESTS.

Additional Patents Relating to Pest Control

By DR. R. C. ROARK

EDITOR'S NOTE: *This service is provided through the Department of Agriculture for the purpose of bringing to the attention of those interested such matters that may be of assistance to the industry. The Department of Agriculture assumes no responsibility for the merits or workableness of any of the inventions mentioned. Copies of all patents can be obtained for 10c (no postage stamps) sent to the Patent Office, Washington, D. C. When placing orders be sure to note the number of the patent, the date, the name of the patentee and the subject of the invention.*

2,122,487 (July 5, 1938; appl. Oct. 17, 1935). INSECT TRAP. Santos Pastor, New York, N. Y.—This trap utilizes an electric light to lure the insects into a cage in which they may be destroyed.

2,122,533 (July 5, 1938; appl. Dec. 5, 1936). SPRAY GUN CONTAINER HOLDER. Harold U. Mitchell, Medford, Ore.

2,122,559 (July 5, 1938; appl. Oct. 29, 1937). SPRAY GUN. Louis G. Dapero and Peter C. Dapero, Summit, N. J.—This spray gun is especially adapted for use in spraying trees without the necessity for climbing trees or the use of ladders.

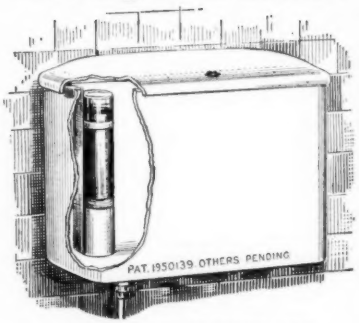
2,122,781 (July 5, 1938; appl. May 16, 1935). PARASITICIDES. Paul L. Salzberg, Edge Moor, Del.—E. I. du Pont de Nemours & Company, Wilmington, Del.—An insecticidal composition comprises as the toxic ingredient a compound of the formula R'CNS wherein R' is an alicyclic hydrocarbon radical chosen from the group consisting of naphthenyl radicals and cyclic terpene hydrocarbon radicals.

2,122,853 (July 5, 1938; appl. Dec. 20, 1933). MEANS FOR FUMIGATING MATERIALS. John L. Biggs, Calumet City,

(Continued on page 25)

Distributors Wanted For

Steryl-Flush



CREATES NEW MARKET FOR YOUR PINE OIL

Concealed Guardian of the Modern Bath Room

STERYL-FLUSH disinfects, deodorizes and keeps the entire toilet system clean.
Does not cover up offensive odors, but removes them completely.

STERYL-FLUSH fits inside the toilet tank where it operates unseen.
It operates only when the toilet is used by flow of water.
Non-corrosive and non-injurious to the hands, but has a disinfecting strength four times stronger than phenol (carbolic acid).
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Ill.—This invention relates to an improved means for using hydrocyanic acid or other deadly gas for fumigating edible products and has for its principal object the provision of means whereby the fumigation may take place in safety in a congested factory or in close proximity to other workers.

2,122,861 (July 5, 1938; appl. May 24, 1935). MANUFACTURE OF CALCIUM ARSENATE. Arthur H. Henninger, Floral Park, N. Y.—General Chemical Company, New York, N. Y.—The patentee claims in the manufacture of calcium arsenate by the addition of an aqueous arsenic acid solution to an aqueous slurry of calcium hydroxide, the improvement which comprises gradually introducing the arsenic acid solution below the surface of the slurry and adjacent to the periphery of a rapidly rotating agitating rotor submerged in the calcium hydroxide slurry so as to effect substantially instantaneous diffusion of the arsenic acid solution through the slurry and regulating the addition of arsenic acid solution so that the molar ratio of arsenate to calcium in the resultant diffused mixture does not exceed such ratio in basic calcium arsenate, whereby a calcium arsenate is directly produced capable of application to foliage without causing substantial burning thereof.

2,123,127 (July 5, 1938; appl. Feb. 8, 1938). INSECT ELECTROCUTING DEVICE. Willis A. Whipple, Camp Lake, Wis. Robert Malsom, Chicago, Ill.

2,123,190 (July 12, 1938; appl. April 3, 1935). INSECTICIDE AND METHOD OF MAKING SAME. John F. Les Veaux, Middleport, N. Y.—Niagara Sprayer and Chemical Co., Inc., Middleport, N. Y. A method of treating calcium arsenate to reduce its injurious effect when applied to living plants comprises heating the calcium arsenate while in a substantially dry state to a temperature of between about 1100° F. and about 2200° F. for a period of time not less than about ½ hour and not more than about two hours.

2,123,191 (July 12, 1938; appl. June 4, 1936). INSECTICIDE AND METHOD OF MAKING SAME. John F. Les Veaux, Middleport, N. Y.—Niagara Sprayer and Chemical Co., Inc., Middleport, N. Y. A method of reducing the injurious effect of calcium arsenate containing lime on living plant organisms comprises preparing the said insecticide in a substantially dry granular state or condition and heating the said granular insecticide to a temperature between about 1100° F. and 2200° F.

2,123,192 (July 12, 1938; appl. June 4, 1936). METHOD OF MAKING INSECTICIDE. John F. Le Veaux, Middleport, N. Y.—The patentee claims in the method of making insecticidal calcium arsenate adapted for use for controlling the normally occurring insect pests on relatively tender growing plants, the steps which comprise chemically interacting gaseous oxygen with pulverized calcium arsenite to form calcium arsenate, maintaining the particles of the calcium arsenite, during and after their oxidation at a temperature between about 1100° F. and 2200° F. by removal of a portion of the exothermal heat produced by said interaction until a representative sample of the product thus obtained, weighing about 1½ grams, when brought into intimate contact with about ¼ gram of carbon dioxide dissolved in about 750 cc. of water at a temperature of about 65° F. for about 30 minutes with stirring reacts with the carbon dioxide and water to form an amount of soluble arsenic, expressed as metallic arsenic, not more than about 2% of the weight of the sample, and discontinuing the heating before a second representative sample weighing about 1.5 grams, when brought into intimate contact with about 2 grams of carbon dioxide dissolved in about 750 cc. of water at temperature of about 65° F. for about 30 minutes with stirring reacts with the carbon dioxide and water to form an amount of soluble arsenic, expressed as metallic arsenic, less than about ½% of the weight of the sample.

2,123,572 (July 12, 1938; appl. May 1, 1937; in Switzerland May 9, 1936). MOTH-PROOFING COMPOSITION. Henry Martin and Rudolf Hirt, Basel, Switzerland—J. R. Geigy S. A., Basel, Switzerland. A mothproofing composition contains as its essential active ingredient a thianthrene.

2,123,899 (July 19, 1938; appl. July 18, 1936). WOOD PRESERVATION. David W. King, Knoxville, Tenn. One of the objects of this invention is to provide an economical means for the preservation of wood products, a portion only of which are required to be set in soil. Another object of this invention is to simultaneously treat two portions of individual units of wood with vapor and liquid, respectively. Other objects of this invention include the provision for an effective means for the treatment of wood or wood products with the vapors or a distillable preservative.

2,123,988 (July 19, 1938; appl. Oct. 11, 1937). APPARATUS FOR APPLYING LIQUID POISON TO PLANTS. Alex M. Corley, Salley, S. C. This apparatus is adapted to apply a liquid insecticide to the cotton plant, for destroying the boll weevil, and will apply the poison, to a considerable extent, to the undersides of the leaves and branches.

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Calico Seed is a ready-to-use preparation that lures and quickly kills mice. Absolute Money-back Guarantee. No objectionable odors. Used in foreign countries and coast to coast by the largest Public Warehousemen, Seedmen and Public Exterminators. Highly recommended.

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Householders whose homes are infested with rats must do their own rat-killing, it was learned yesterday, when Dr. Herman N. Bundesen, president of the board of health, announced that the city has no funds for the purpose. He had received a complaint from Frank Evesto, 1819 West Adams Street. At one time there was a WPA fund for rat extermination, but it was exhausted last February, Dr. Bundesen said.

EDITOR'S NOTE: *The above appeared in a Chicago, Ill., newspaper. It would appear that the good doctor would like to spend more money on campaigns. There is one constructive suggestion that could have been made and that is that possibly a commercial pest control operator would really do the job as it should be done. Such work is not expected to be done by a city administration but the Health Department ought more properly to recommend and even urge property owners to employ a commercial pest control operator.*

RAT CAMPAIGNS

There has been so much said about the famous rat campaigns of Chicago with the real need of rolling up a few sleeves and doing some genuine "house cleaning"—more properly, alley cleaning—rather than spending money foolishly for the free distribution of baits—that we felt that we would write nothing further than to reprint a picture that appeared in the Daily Times of Chicago and the caption that the picture carried with it.

Filth creeps back—For a time following TIMES Reporter Frank Smith's series on insanitary conditions of Chicago's streets and alleys, city had a scrubbed and polished appearance. But now, as can be seen in this view of alley between Wells and LaSalle looking toward Wendell in Ald. Dorsey Crowe's 42d ward, the dirt is being allowed to pile up again. (TIMES Photo)

Daily Times, Chicago, Monday, August 29, 1938

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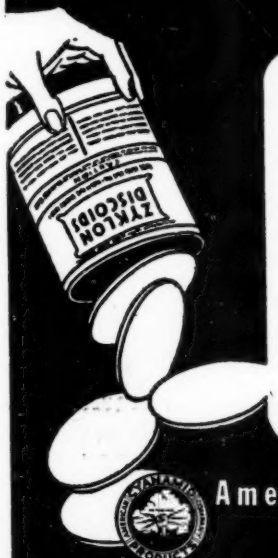

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